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~~Chem & Phys~~
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~~Royal~~ THE INSTITUTE OF CHEMISTRY
OF
GREAT BRITAIN AND IRELAND.

FOUNDED, 1877.
INCORPORATED BY ROYAL CHARTER, 1885.

JOURNAL AND PROCEEDINGS.
1921.

PART I.

Issued under the supervision of the Publications Committee.

RICHARD B. PILCHER,
Registrar and Secretary.

30, RUSSELL SQUARE, LONDON, W.C. 1.
February, 1921.

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Publications Committee, 1920-21

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Report of the Council

(1920—1921)

To be submitted to the Fellows and Associates of the Institute at the Forty-third Annual General Meeting, to be held on Tuesday, 1st March, 1921.

I. THE ROLL OF THE INSTITUTE.

The Council report that during the twelve months ending 31st January, 1921, they have re-elected 3 Fellows, and have elected 43 new Fellows, of whom 22 were Associates; they have elected 324 new Associates, of whom 68 were Registered Students; and they have admitted 426 new Students.

The Council regret to record the death of 28 Fellows and 4 Associates.

FELLOWS.

Henry Kelway Bamber.
Henry Bassetts, senr.
Alexander Cunningham.
William Hodgson Ellis, M.A.,
M.D.
Walter William Fisher, M.A.
Jacob Grossman, M.A., Ph.D.
Charles Edward Groves, F.R.S.
Thomas Sidney Haines.
Archibald Hall.
Edward Kinch.
George Lewin.
Edgar Alan Masters, B.Sc.
Robert McAlley.
Rudolph Messel, Ph.D., F.R.S.
Charles Clifton Moore.
Lucius Trant O'Shea, M.Sc.
Julius Oster-setzer.

Percival S. Umfreville Pickering,
M.A., F.R.S.
George Pilkington.
John Ruffle.
John Emilius Lancelot Shadwell.
John Shields, D.Sc.
Charles Simmonds, B.Sc.
Watson Smith.
Adolph Urieh.
Samuel Archibald Vasey.
Leonard Philip Wilson, F.C.G.I.
Arthur Wingham.

ASSOCIATES.

Arnold Boswell, B.A.
Frederick William Francis Day.
William Arthur Haward, B.Sc.,
A.R.C.S.
Arthur Howard Jay.

4 Fellows, 4 Associates, and 13 Students have resigned, and the names of 15 Students have been removed in accordance with the By-Laws.

At the date of this Report the Register contains the names of 1,562 Fellows, 1,708 Associates, and 799 Students. The number of members has increased by 309 and of Students by 330.

2. THE WORK OF THE COUNCIL.

The Council have held 15 Meetings, and the Committees, Boards, and Sub-Committees have held 99 Meetings.

The following is a list of the Committees, with the names of their respective Chairmen :—

COMMITTEE.	CHAIRMAN.
Finance	The Hon. Treasurer.
General Purposes	The President.
Glass Research	Sir George Beilby, Past-President.
	Vice-Chairman :
	The President.
Benevolent Fund	The Hon. Treasurer.
House	George Stubbs.
Lectures	The President.
Legal and Parliamentary	Horatio Ballantyne.
Library	Alexander Findlay.
Nominations, Examinations and Institutions	The President.
Public Appointments	A. Chaston Chapman.
Publications	O. L. Brady.
Reagents	A. Chaston Chapman.
Research Chemicals	Gilbert T. Morgan.
Services	The President.
Special Committee <i>re</i> Hon. Corres- ponding Secretaries	The President.

Sir Herbert Jackson, President, has been appointed a Governor of the Imperial Mineral Resources Bureau.

The President has continued to act as a member of the Treasury Committee for the selection of Temporary Assistants in the Government Laboratory.

Mr. Horatio Ballantyne, Vice-President, has served as representative of the Institute on a War Office Committee appointed to enquire into the status and functions of the Directorate of Chemical Inspection, Royal Arsenal, Woolwich.

The President and Sir James Dobbie, Past President, have continued to represent the Institute on the Conjoint Board of Scientific Societies, and the President on the Federal Council for Pure and Applied Chemistry.

Sir William Tilden, Past President, has continued to serve, as representative of chemistry, on the Council on Medical and Allied Services, Ministry of Health, and Dr. J. F. Tocher, on the Consultative Council of the Scottish Board of Health.

Mr. Horatio Ballantyne, Mr. Francis H. Carr, Mr. Kenneth M. Chance, Mr. Charles A. Hill, and Mr. William Macnab were appointed to represent the Institute at a Conference on the desirability of standardising plant and apparatus employed in chemical industries, and on the formation of a Sectional Chemical Engineering Committee of the British Engineering Standards Association. The Sectional Committee has been duly constituted, and the views of the Council on the proposed work have been communicated to the Association. Sub-Committees have been appointed to prepare standard specifications for certain forms of chemical plant.

Mr. Frank W. Harbord and Dr. J. J. Fox have continued as representatives of the Institute on the Aircraft Sub-Committee on Chemicals of the British Engineering Standards Association.

Dr. O. L. Brady, Mr. Cecil H. Cribb, and the Registrar represented the Institute as members of a deputation from the National Union of Scientific Workers and other Bodies, received by the Commissioners of Income Tax on 10th December, 1920, to request the consideration of abatements of tax in respect of certain expenses incurred by scientific workers. The negotiations are proceeding.

The Registrar continued as a member of the Resettlement of Officers' Committee of the Appointments Department of the Ministry of Labour until it was dissolved in November. He is still serving as a member of the Grants Committee of the same department, and as a member of a Committee of the Employment Department of the Ministry in co-operation with the Incorporated Association of Headmasters.

On 1st December, 1920, a deputation of manufacturers of and dealers in laboratory ware was received at the Board of Trade in support of the Key Industries Bill so far as it related to laboratory glassware. The Council having been invited

to appoint representatives to form part of the deputation, decided that they would not undertake to give expression to views of a political character ; but in view of the work of the Glass Research Committee and the help rendered by manufacturers during the war, the Council held that the Institute should be represented at the Interview. The President and the Hon. Treasurer, with Mr. A. Chaston Chapman, Mr. F. H. Carr and Mr. William Macnab were appointed for this purpose. The proceedings were reported briefly in the Journal, Part VI., 1920. (See also Glass Research Committee, p. 10.)

The Council, having learned with much regret of the proposal of the authorities of the City and Guilds of London Institute to close the Finsbury Technical College in June, 1921, empowered a number of members to take part in a movement towards securing the continuance of the College, and allowed the use of the Council Room for meetings held in that connection. The President joined with the Presidents of many other scientific and professional bodies in subscribing to a memorial to Lord Halsbury, Chairman of the Governing Body, urging that no pains should be spared to preserve the College. Definite information with regard to the future of the College has not yet been received, although it is understood that favourable negotiations are in progress.

3. FINANCE.

The Financial Statements for the year 1920 are given on pp. 24-28.

GENERAL ACCOUNT.—The Statement of the General Account for 1920 includes under Expenditure several items, amounting to £1206 9s. 9d., which may be regarded as extraordinary, including the liabilities (mainly relating to printing, house repairs and equipment, on General Account and Building Fund Account brought forward from 1919), with the first premium, £88 6s. 8d., on the Building Redemption Fund, which may be regarded as an investment, and, therefore, ranks as an Asset. The Hon. Treasurer and Finance Committee have had careful regard to the necessity for exercising economy. They have had to meet the difficulties arising

from the increased cost of labour and materials : the cost of printing, for example, has increased by 140 per cent. for labour, and by 200-300 per cent. for paper ; fuel also is considerably higher. At the same time, the increasing business of the Institute and the increasing membership have necessitated a larger staff. The cost of the revision of the By-laws is an item of expense which should rarely recur. The By-laws had not been altered in any way for nearly thirty years and the Council propose that the whole cost shall be a charge on capital account ; but the revision of the Regulations, the house repairs which had accumulated during the war, the extension of the Proceedings in the form of the present Journal, the financing of Local Sections, and similar charges, will be met from current income. Having regard to the increasing membership, the normal expenditure will not be found out of proportion to that of 1919.

On the Receipts side, the amount for subscriptions is larger than that for 1919 by over £500.

The amounts received for Life Compositions, £625 6s., and the repayment of part of the loan to the Building Fund, £449 14s., will be placed to capital account, and invested together with a sum of £37 9s. 9d. due for investment on 1919 account.

An approximate statement of Profit and Loss, on the year's working, disregarding the depreciation or appreciation of investments, may be abstracted as follows :—

	£	s.	d.			£	s.	d.
Ordinary Receipts..	7154	4	1	Ordinary Expendi- ture	6871	14	10	
Less Balance, Dec. 31, 1919	666	16	3	Plus Subs. received in advance ..	91	3	0	
	6487	7	10					
Redemption Premium	88	6	8	Fees on applications in abeyance ..	37	5	6	
Accounts due ..	224	0	10	Accounts due for payment ..	305	7	9	
Balance in hand ..	455	2	4					
Difference	50	13	5					
	£7305	11	1		£7305	11	1	

In the above abstract the Liabilities in respect of Rent and the Library are excluded, because the full amounts for them are already included in the ordinary expenditure. Exclusive of ordinary items of receipt and expenditure, the net result for the year 1920 shows that the outgoings (including the extension of the Journal, with corresponding increase in postage and stationery, Local Section expenses and increased Library Grant) have not seriously exceeded the income for the year.

The Committee believe, moreover, that recent activities justify the expenditure involved and that when the initial outlay has been met, and more normal conditions are restored, the Institute will be able to place to capital account all sums reserved for investment and even to show a balance in hand at the end of each year.

BUILDING FUND.—The accounts for the year show additional receipts amounting to £734 8s. 6d. The Fund has now been closed, and a summary of the Account is attached.

Mainly owing to the trades dispute which occurred in 1914 and to difficulties arising from the war, the cost of the building exceeded the original estimates ; but it will be seen that notwithstanding adverse conditions the contributions received amounted to about £19,000, which was raised at an expense of £400 (*i.e.* little more than 2 per cent.) ; that this expense was more than covered by the interest and dividends on investments, and that although the Council were authorised, if necessary, to draw upon the General Fund of the Institute to the extent of £3500, the deficit to be met amounts to less than £1500. Against this deficit, moreover, the appeal may be said to have been directly productive of prospective legacies of £1000 and £500 under the wills of Mr. Edward Riley and Prof. Meldola respectively.

The Council, in acknowledging their grateful thanks to all contributors, feel that the Institute has been very fortunate in having acquired its premises before the increased cost of materials and labour rendered their erection prohibitive.

(The List of Donations received since the List of Contributors was published in July, 1916, is given on p. 84 of this Part of the Journal.)

BENEVOLENT FUND.—The scheme for the establishment of a Benevolent Fund as a Memorial to the Fellows, Associates, and Registered Students who died in the service of their country during the war was published in June, and a sum of £312 4s. 3d. has since been received from Fellows and Associates. All expenses incurred in connection with the Fund have been debited to the Account.

Up to the present no call has been made upon the Fund. This is due, no doubt, to the fact that very few chemists are without appointments ; but the Council hope that members will contribute what they can to provide against contingencies which may arise should these conditions become changed. The Fund should prove of invaluable service in times of stress, especially as an adjunct to the Appointments Register. That Register should obviously be regarded as the chief means of affording aid to those in need through lack of employment, but where misfortunes arise from such causes as disablement, or other infirmity, the Benevolent Fund Committee hopes, through the generosity of the contributors to the Fund, to be in a position to afford liberal help, and looks to the Local Sections and the members individually to co-operate in the scheme.

4. GENERAL PURPOSES COMMITTEE.

The main work of the General Purposes Committee has consisted in the Revision of the By-Laws, a task of considerable difficulty and responsibility. The Committee endeavoured to collate the suggestions of the Committees of Local Sections and Honorary Corresponding Secretaries. The new By-Laws, which were eventually submitted to Extraordinary General Meetings of the Institute held on 28th October and 12th November and adopted, will come into force as soon as they are allowed by the Privy Council.

The Committee has further investigated the question of the remuneration and conditions of appointment of chemists occupying whole-time positions, and has reported on the returns received to a circular regarding this enquiry issued in August and October, 1920. (See p. 44.) The Committee has also had before it, on the suggestion of the Manchester Local Section, the subject of agreements for chemists in whole-time employ, with a view to the formulation of a form of contract which might be generally adopted, and hopes to report in the near future.

In collaboration with representatives of the National Union of Scientific Workers, the Committee has reviewed the position, in relation to income tax, of scientific workers engaged in whole-time and part-time appointments, especially having regard to payments incidental to the successful pursuit of their respective callings. The Committee has also reported on a question raised regarding the assessment, for purposes of Income Tax, of the proceeds of the sale of inventions and patents. (Journal, Part III., p. 160.)

The Committee has formulated the scheme for the election of District Members of Council under the new By-Laws. Particulars of the scheme will be published in the Journal (p. 30), and an Extraordinary General Meeting of the Institute will be called in due course to determine the Districts.

The Committee has also had under consideration the desirability of the names of members of the Institute appearing in uniform type in directories. This matter also will be submitted for discussion at a Conference to be held immediately after the Extraordinary General Meeting which will be called to determine the Districts.

5. GLASS RESEARCH COMMITTEE.

In the *Journal*, Part III., 1920, the Glass Research Committee published schemes for the testing of Laboratory Resistance Glassware and Laboratory Porcelain.

The Committee feels that under the conditions prevailing pending the decision of the Government with regard to key

industries, British manufacturers of laboratory ware have been hampered in the development of their production. The Committee hopes, however, that the manufacture of satisfactory supplies of laboratory requirements will become firmly established in this country, and will be prepared to assist both manufacturers and users in the investigation of questions bearing on such production, so far as lies in its power, without trenching on the ground allotted to other organisations.

In agreement with the Department of Scientific and Industrial Research, the Board of Education and the Board of Trade, the Council, on the recommendation of the Committee, have therefore urged users of chemical glass to give their support to the industry, although they agree that, in the event of supplies, satisfactory as to quality, quantity and price not being forthcoming, chemists will have no alternative but to obtain them elsewhere.

The Council indorse the views expressed by Mr. A. Chaston Chapman before the Board of Trade, reported in the *Journal* (Part VI., p. 313). The Council recognise the debt of chemists to manufacturers who endeavoured to create the chemical glass industry during the war, and hope that they may be afforded a fair chance to establish it, in order to prevent a recurrence of the situation with which chemists were faced in 1914.

The Council recognise also that it is no part of the functions of the Institute to take part in political matters on which the views of the members generally may be divergent, but they will continue to watch any legislation which may be promoted affecting the interests of the profession.

6. HOUSE COMMITTEE.

The Council learn that the premises of the Institute are within the site granted by the Government for the University of London, but they hope that the Institute's tenancy will remain undisturbed.

The building of the Institute has been maintained in good repair. The bookcase purchased with the bequest of Mr. George T. Holloway has been placed in the Council Room. It contains the books, formerly the property of Sir Humphry and Lady Davy and of John Davy, also bequeathed by Mr. Holloway.

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Mrs. Bedford McNeill has presented the Institute with a bronzed cast figure of Priestley. *Journal*, Part II., 1920 (pp. 98 and 141).

The Memorial to Fellows, Associates, and Students who died in the service of their country during the war has been erected in the vestibule, and was unveiled by the President on 28th October, 1920.

Accommodation has been provided in the Laboratories of the Institute for the Director and Chemists of the British Photographic Research Association, and for other chemists engaged in research work.

In June, 1920, the Council co-operated with the London Section of the Society of Chemical Industry in arranging an exhibition of apparatus and materials which was held on the premises of the Institute, and to which Fellows and Associates were invited.

7. LECTURES COMMITTEE.

A lecture on "Some Scientific Aspects of Tanning" was delivered before the Institute by Mr. Joseph Turney Wood at University College on 24th November, 1920, and has since been published and issued to Members and Registered Students. Arrangements will be made for further lectures to be delivered and published during 1921.

The Lectures Committee has suggested that Fellows and Associates should take part in popularising chemistry by giving suitable lectures before local scientific and literary societies, and has asked Local Sections to allow their members to invite friends to meetings held under their auspices when the subjects under discussion are not of a highly technical or purely professional character.

8. LIBRARY COMMITTEE.

The Council and Library Committee have had the pleasure of acknowledging many gifts of books and periodicals from authors, publishers, and members, and have made some useful additions to the Library from the Annual Grant allotted to this purpose.

The Library Fund at the close of 1920 showed a balance of £33 17s. 4d.

THE LIBRARY OF THE CHEMICAL SOCIETY.

The Council again record their appreciation of the privileges allowed to members of the Institute in the use of the Library of the Chemical Society.

9. LOCAL SECTIONS.

The Local Sections have held meetings for the discussion of papers of professional and technical interest and for the promotion of social intercourse among their members.

The Registrar has attended meetings and functions of several Sections.

The Council have been indebted to the Sections for suggestions on various matters, and also for assistance in connection with the revision of the By-Laws.

A Conference of the Hon. Secretaries of Sections was held at the Institute in April, when the main subject discussed was the allocation of Fellows and Associates to districts for the purpose of electing District Members of Council under the provisions of the new By-Laws. The Conference also met the Finance Committee and the Nominations, Examinations, and Institutions Committee.

The Council are fully satisfied that the work of the Sections is beneficial to the best interests of the Institute, and would urge Fellows and Associates to join the Sections in their respective districts.

10. NOMINATIONS, EXAMINATIONS & INSTITUTIONS COMMITTEE.

The Committee has held 30 Meetings.

The applications received and considered, with the decisions thereon, are summarised below :—

Applications for Admission to the Studentship :

Accepted	..	..	..	..	..	..	426
Declined	..	..	..	..	..	..	11
Total	..	..	..	..	..	..	437

Applications for Admission to Examination for Associateship :

Accepted	..	..	..	..	..	..	20
Declined	..	..	..	..	..	..	5
Total	..	..	..	..	..	..	25

Applications for Election to the Associateship :

*Accepted	..	..	..	..	..	..	324
Referred for Examination	..	..	..	..	..	..	83
Declined	..	..	..	..	..	..	56
Postponed for compliance with Regulations	..	..	..	..	..	..	57
Total	..	..	..	..	..	..	520

* By Examination : 18

Applications for Admission to Examination for Fellowship :

Accepted	..	..	..	..	..	..	4
Declined	..	..	..	..	..	..	2
Total	..	..	..	..	..	..	6

Applications from Associates for Election to Fellowship :

Accepted	..	..	..	..	..	..	22
In abeyance	..	..	..	..	..	..	16
Declined	..	..	..	..	..	..	5
Total	..	..	..	..	..	..	43

Applications for Election to the Fellowship :

†Accepted	..	..	..	..	..	..	24
Referred for Examination	..	..	..	..	..	..	11
Declined	..	..	..	..	..	..	16
In abeyance	..	..	..	..	..	..	10
Total	..	..	..	..	..	..	61

† Re-election : 3; by Examination : 6

*Applications from Institutions applying for recognition
for the training of Candidates for the Associateship
of the Institute :*

Accepted	2
Postponed, pending compliance with conditions prescribed by the Council	2
Total	<hr/> 4

The Committee, therefore, dealt with 1,096 applications, apart from numerous letters of enquiry on individual cases.

90 Candidates were interviewed by the Committee or by Local Committees appointed by the Council by agreement with the Local Sections. The thanks of the Council are accorded to the local Interviewing Committees for their valuable help and reports.

REGULATIONS.—The Regulations as revised by the previous Council were published in March, 1920, and reprinted in August.

EXAMINATIONS.—The Council have received reports on Examinations held in April, July and October, 1920, and January, 1921.

The results are summarised in the following table :—

		EXAMINED.	PASSED.
<i>Associateship :</i>			
Branch (a)	Mineral Chemistry ..	2	1
Branch (b)	Metallurgical Chemistry ..	3	1
Branch (d)	Organic Chemistry ..	0	4
Branch (e)	Chemistry (and Microscopy) of Food and Drugs ..	8	6
Branch (f)	Biological Chemistry, etc. ..	2	2
Branch (g)	Chemical Technology ..	5	3
General Chemistry (New Regulations) ..		2	1
<i>Fellowship :</i>			
Branch (b)	Metallurgical Chemistry ..	1	1
Branch (d)	Organic Chemistry ..	2	2
Branch (e)	Chemistry (and Microscopy) of Food and Drugs, etc. ..	2	1
Branch (g)	Chemical Technology ..	2	2
<i>Associates Examined for Fellowship :</i>			
Branch D. Agricultural Chemistry ..		2	2
<i>Fellow Examined for Certificate in the</i>			
Chemistry of Food and Drugs, etc. ..		1	0
		<hr/> 32	<hr/> 26

The thanks of the Council have been accorded to the authorities of the Royal Technical College, Glasgow, the University of Leeds, the Lister Institute, and the College of Technology, Manchester, for the use of laboratories, and to the following members, who have acted as additional Examiners and otherwise assisted the Board of Examiners in connection with Examinations in Special Branches: Prof. J. W. Cobb, Prof. C. H. Desch, Prof. Thomas Gray, Dr. E. Knecht, Mr. J. Macleod, and Mr. F. M. Rowe.

INSTITUTIONS.—The Leeds Central Technical School (full day course) has been added to the List of Institutions recognised by the Council for the training of candidates for the examinations of the Institute. Applications from other institutions have been considered, but remain in abeyance pending compliance with certain requirements of the Council.

II. PUBLIC APPOINTMENTS COMMITTEE.

The Public Appointments Committee, whose work is concerned with matters affecting the public interest and chemical appointments, has advised the Council with regard to matters concerning chemists holding such appointments.

The negotiations which have passed during the year between the Council and various Government Departments (including the Admiralty, the Board of Education, the Board of Trade, the Ministry of Health, the Ministry of Labour, the Department of Scientific and Industrial Research, and the War Office) have been reported from time to time in the *Journal*.

The Council learn that the terms of service of chemists in several Government Departments have been improved, and hope that in the near future the positions of other chemists in the Government Service will receive due consideration with no less satisfactory result.

Representation has been made to the Burnham Committees of the Board of Education with a view to securing due recognition of the qualifications of members of the Institute engaged in teaching chemistry.

The representations addressed to a County Council regarding the informal testing of milk by food inspectors (Part IV., p. 238) were duly acknowledged by the authorities, who determined, however, to pursue the course which they had decided to adopt. The matter will be watched in the interests of the adequate administration of the Sale of Food and Drugs Acts.

The Council have also communicated with municipal and county authorities with regard to the conditions attached to the appointments of Public Analysts. In the case of the Metropolitan Borough of Stepney, to which reference was made in the *Journal* (Part II., 1920, p. 118-120), the Council learn that the conditions attached to the appointment have been substantially improved.

The Councils of the Institute and the Society of Public Analysts have received returns from public analysts showing that the majority of these officers have recently obtained additions to their emoluments (see p. 52).

The prevailing conditions have rendered it imperative for all professions to look to their interests, and it is necessary for chemists, no less than medical men and lawyers, to co-operate in modifying accordingly their fees for professional services. A schedule of fees now regarded as reasonable for various analyses has been prepared by the Public Appointments Committee, and members can obtain information with regard to such matters by applying to the Registrar, indicating the nature of the work in question.

The Public Appointments Committee has noted with interest the Report of the Chemical Services Committee of the Government of India referred to in the *Journal* (Part III., p. 186). The Government appears to be disposed to take an increasing interest in the work of chemists in that Empire, but it is important that chemists who contemplate becoming candidates for appointments in India should make themselves fully acquainted with the conditions of life there in order to obtain suitable status and prospects.

12. RESEARCH CHEMICALS AND REAGENTS.

Acting on the advice of a Special "Research Chemicals" Committee, the Council have co-operated with the Association of British Chemical Manufacturers and with other bodies in making known to chemists the progress made in this country in the production of organic chemicals for research purposes. A preliminary list of such products was published in June, and, pending further developments, the Council offered facilities to students and research workers, acting as a "clearing house" for substances which were not easily obtainable. Several chemists were able by this means to secure materials from others who happened to have them in hand. The list of such substances produced by British manufacturers has since been considerably augmented, and the Institute still frequently assists in securing information as to where these materials can be obtained.

THE REAGENTS COMMITTEE has recommended the Council not to reprint the Pamphlet on Reagents for Analytical Purposes (published in 1915), but proposes to discuss suggestions for the revision and extension of the tests for reagents for publication from time to time in the *Journal*. Several useful suggestions, which have already been received from manufacturers and users, are now under the consideration of this Committee.

13. SERVICES COMMITTEE.

The Services Committee, appointed to consider the position of chemists and metallurgists in the Naval, Military, and Air Services and the action to be taken to secure for them better recognition and status, formulated a report, including a draft scheme for the establishment of an Army Chemical Service, which was duly received by the Council. In the view of the Committee the principles underlying its scheme were applicable to other scientific professions, and since the Conjoint Board of Scientific Societies had determined to investigate the whole question, the Council forwarded the Report of the Committee to the Board, and are awaiting further development.

14. HONORARY CORRESPONDING SECRETARIES.

The Council record their indebtedness to the Honorary Corresponding Secretaries in Overseas Dominion and in India for services during the year, especially for reports upon applications from candidates for membership and for advice on matters of professional interest in their respective countries.

15. APPOINTMENTS REGISTER.

The successful working of the Appointments Register is indicated by the fact that at no time during the year 1920—a period of stress and general lack of employment in nearly every professional calling—did the number of members actually without appointment exceed 0.75 per cent. of the total membership of the Institute. The number has slightly increased, however, during January, 1921.

Many Fellows and Associates have been helped to improved positions, and many recently qualified members have been absorbed into industry and commerce, through the Register.

In addition to the Appointments Register for qualified chemists the Institute has established similar Registers for laboratory assistants, and for students who are desirous of gaining practical experience in private laboratories or works during vacations. The Council look to the continued co-operation of Fellows and Associates in their endeavours to secure suitable positions for such assistants and students.

The Council believe that there is no more powerful agency for promoting the consolidation and maintaining the status of the profession than ensuring the constant employment of its members, for which purpose the Appointments Register of the Institute is invaluable. They are able, through the influence of the Institute in this matter and from long experience in the conduct of the Register, to confer with leaders of industry, to help employers to secure the services of the best chemists available, and, on the other hand, to introduce chemists to appointments carrying conditions suitable to their

status. Further, they hold that, if employers will adhere to the scheme provided for the recruitment of laboratory assistants, those appointed to junior positions will be only such as are of adequate general education and have a reasonable prospect of qualifying in the profession, while a check will be put upon the influx of those for whom chemistry offers only a "blind-alley" occupation, and the staffing of technical laboratories will be developed on an increasingly sound and efficient basis.

16. LEGAL AND PARLIAMENTARY.

This Committee has been appointed to watch measures promoted in Parliament which may affect the interests of the profession of chemistry.

The Committee communicated with the Board of Trade on the Gas Regulation Act with special reference to the evidence of competency to be required from candidates for appointment as Gas Examiners under the Act. The Committee hoped that the Act would provide that such appointments should be subject to confirmation by the Board, as the appointments of public analysts, made under prescribed regulations, are subject to confirmation by the Ministry of Health. The Board preferred, however, that the responsibility of appointing competent and impartial persons to these offices should remain with the local authorities. The Committee held it desirable that the Board should at least indicate the nature of the qualifications required, but learned that the Board did not propose to interfere unless good cause for such action should arise. The Board has not issued any orders or regulations regarding the method of appointing gas examiners and no appointments are likely to be made before April. In the meantime, the Public Appointments Committee of the Institute has been asked to formulate views on the qualifications necessary for these appointments in order that they may be transmitted to the Board. (See p. 40.)

In connection with proposed new legislation for the inspection and control of workshops, a question was raised by a Fellow who had been informed that the laboratories of practising chemists would be subject to a new Workshops Act. From enquiries made at the Home Office, the Committee learned that no change had been made in the law, and that chemical laboratories as such did not come within the scope of the Act. Where a chemical laboratory forms part of a factory it is liable to inspection as is the rest of the factory. The laboratories of private practitioners are not so liable, and the Home Office will investigate any case of inspection of such a laboratory by officials under the Act.

The Committee considered, amended and approved for publication the legal notes which appeared in Part VI. of the *Journal* referring to (i.) the powers of Bodies incorporated under Royal Charter, and (ii.) contracts in restraint of trade. The work and functions of the Institute were carefully reviewed in the light of the judgment of Mr. Justice Peterson in the first case, and the Committee reported that it found no reason on that account why the Council should restrict the present activities of the Institute on behalf of its members and students.

The Dyestuffs (Import Regulations) Bill was also before the Committee, which took steps to bring to the notice of the Board of Trade the advisability for making due provision for facilities for the import under favourable conditions of small quantities of rare organic substances required for research and unobtainable in this country. (See p. 43.)

The Committee has also given consideration to the desirability and possibility of the Institute taking steps to obtain statutory restriction of the practice of chemistry to duly qualified and registered chemists, at least, in the first instance, in matters affecting the health of the community and the safety of workers in dangerous trades. The Committee is not yet in a position to report to the Council on this matter.

17. PUBLICATIONS.

Following the programme outlined in the Report for 1919-1920, the Publications Committee has supervised the issue of the *Journal and Proceedings* in six parts during 1920.

The Committee desires to develop the official organ of the Institute on lines that will encourage Fellows and Associates to maintain a keen interest in all matters affecting the welfare of their profession, and will welcome any suggestions from Local Sections or from individual members for increasing the usefulness of the *Journal*.

18. THE RETIRING PRESIDENT.

On March 1st, Sir Herbert Jackson completes his term of three years in the office of President. The Council would remind the Fellows and Associates that Sir Herbert accepted office, in succession to Sir James Dobbie, while the war was still unwon and shortly after the Council had initiated and embarked upon a new course in the general policy of the Institute. He was thus called upon to guide its affairs in times of unusual difficulty and responsibility and during the period of reconstruction and resettlement following upon the termination of hostilities.

The Council in recording their high appreciation of his valuable services feel that the position of the Institute has been greatly strengthened under his able leadership, and they accord him their hearty thanks for his invariable courtesy, his able conduct of business and his devotion to the interests of the Institute.

30, RUSSELL SQUARE,
LONDON, W.C.1.

28th January, 1921.

REPORT OF THE AUDITORS.

We hereby report that we have examined the Books and Accounts of the Institute of Chemistry for the year ended 31st December, 1920, and have compared with the vouchers the entries therein, and certify that the following statements are correct as shown by the books. Certificates from the Bank of England and the London County Westminster and Parr's Bank, Ltd., for investments held by them respectively for the Institute at the above date have been produced.

JAMES CONNAH, } Hon. Auditors,
H. DROOP RICHMOND, } 1920-1921.

DAVID HENDERSON,

Chartered Accountant.

February 4th, 1921.

[illegible]

OF GREAT BRITAIN AND IRELAND.

Incorporated by Royal Charter, 1885,

FOR THE YEAR ENDED DECEMBER 31st, 1920

ACCOUNT

1919.	EXPENDITURE.	£ s. d.	£ s. d.
	Printing, Stationery, Office		
	Books, etc.—		
	Journal (Part IV., 1919; Parts I.-V., 1920)	824 13 4	
	Other Printing, Stationery, etc. ..	563 3 5	
£1,070 3 6			1,387 16 9
429 0 0	Postage		469 7 7
300 0 0	Rent		300 0 0
601 4 4	Rates and Taxes		687 16 2
43 14 0	Insurance		65 4 8
229 12 6	Repairs and Furnishing		206 5 0
2,220 19 0	Salaries, Wages, etc.		2,578 2 6
111 12 11	Advertisements		65 15 10
221 14 0	Gas, Water, Electric Light and Power ..		138 9 0
74 14 7	Fuel		121 17 2
	Household		26 14 5
21 8 11	Telephone		23 6 4
	Examiners and Assistants (Fees and Expenses)		379 7 9
86 16 9	Apparatus and Materials		46 8 7
123 18 11	Library Account (<i>see p. 28</i>)		75 0 0
50 0 0	Local Section Expenses		111 0 10
65 5 2	Donations—		
	Chemical Society Library	25 0 0	
	Conjoint Board of Scientific Societies	10 10 0	
	Federal Council for Pure and Applied Science	10 10 0	
46 0 0			46 0 0
160 11 1	Miscellaneous Expenses		95 11 11
	Travelling Expenses		31 15 4
	Auditor's Honorarium		15 15 0
5,856 15 8			6,871 14 10
2,684 14 3	<i>Cost of Stocks bought</i>		
	Extraordinary Expenditure—		
	War Memorial		55 0 0
	Bookcase (G. T. Holloway Bequest) ..		28 10 0
	Printing—		
	1919 Account, including Building Fund, £76 12 6	378 19 6	
	By-laws	95 18 0	
	Regulations	117 2 3	
			591 19 9
	Redemption Fund (1st premium <i>less</i> 20% commission)		88 6 8
	Repairs and Furnishing 1919 <i>%</i> (including Building Fund, £204 0 3) ..		420 3 4
	Local Sections, 1919 <i>%</i>		22 10 0
666 16 3	Balance	455 2 4	
	<i>Less due to Library Fund</i>	23 10 1	
			431 12 3
£9,208 6 2			£8,509 16 10

BUILDING FUND ACCOUNT for the Year ended Dec. 31st, 1920.

RECEIPTS.		£	s.	d.	EXPENDITURE.		£	s.	d.
£280 18 2	Balance at Bank 31st Dec., 1920...	..	..	55 18 6	<i>Balance as at 31st Dec., 1918</i>				
	Contributions ..	..	..	734 8 6	Building Costs—				
					Contractors and Sub-Con-				
					tractors ..				
					General Account—				
					Printing, Station-				
					ery, etc.				
					Repairs and Fur-				
					nishing ..				
					Amount paid to				
					of Loan ..				
				150 0 0	449 14 0				
				55 18 6	<i>Balance at Bank 31st Dec., 1919</i>				
				£280 18 2	730 6 9				
				£790 7 0	£790 7 0				

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Statement of Receipts and Expenditure since the Opening of Building Fund Account, 1909—20.

RECEIPTS.		£	s.	d.	EXPENDITURE.		£	s.	d.
Contributions	18,850 17 7	Site and Building Costs ..				
General Account	1,474 0 2	Expenses ..				
Profit on Investments and Interest	652 18 7	..				
				£20,977 16 4	20,977 16 4				

BENEVOLENT FUND ACCOUNT, June 17th to Dec. 31st, 1920.

RECEIPTS.		EXPENDITURE.	
	£ s. d.		£ s. d.
Cash in Bank 17th June, 1920	.. .. 50 0 0	Postage, Cheque Book, etc.	.. .. ..
Cash in hand 17th June, 1920	.. .. 1 17 0	Balance at Bank—	.. .. ..
Donations and Subscriptions 246 1 6	Current 99 3 4
Interest on Deposit 3 6 3	Deposit 200 0 0
	£301 4 9		299 3 4
			£301 4 9

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ASSETS.		LIABILITIES.	
	£ s. d.		£ s. d.
Balance at Bank 31st December, 1920	.. 299 3 4	General Account
			9 0 6

LIBRARY FUND for the year ended Dec. 31st, 1920.

RECEIPTS.		EXPENDITURE.	
£	s. d.	£	s. d.
£15 18 10			
Balance 31st Dec., 1919	.. 19 18 1	Books, Journals, etc.	.. 61 0 9
Grant from General Account	.. 75 0 0	Balance	.. 33 17 4
50 0 0			
£65 18 10		£94 18 1	

Proceedings of the Council and Committees.

Officers and Members of Council —The Council of the Institute regret that the Privy Council were not able to notify their assent to the new By-laws in time to provide for the election of the new Council in accordance with those By-laws.

The Officers and Members who retire from the Council at the Annual General Meeting, on March 1st, 1921, are : President: Sir Herbert Jackson, K.B.E., F.R.S. Vice-President : Sir James Dobbie, LL.D., F.R.S., and Sir Robert Robertson, K.B.E., D.Sc., F.R.S. Members of Council : Edward Charles Cyril Baly, C.B.E., F.R.S., Oscar Lisle Brady, D.Sc., Alfred Chaston Chapman, F.R.S., John Thomas Dunn, D.Sc., Joseph Henry Lester, M.Sc., William Macnab, C.B.E., George Henry Perry, O.B.E., B.Sc., Francis Martin Potter, M.B.E., B.Sc., and William Maurice Gathorne Young.

The Officers and Members nominated in their stead are :— President, Alfred Chaston Chapman, F.R.S. ; Vice-Presidents, Sir Herbert Jackson, K.B.E., F.R.S., and William Macnab, C.B.E. Members of Council, Arthur Jenner Chapman, Frederick George Donnan, C.B.E., Ph.D., F.R.S., Frederic Herbert Lees, Harold Moore, O.B.E., B.Sc., Thomas Slater Price, O.B.E., D.Sc., William Rintoul, O.B.E., William Henry Roberts, M.Sc., Leonard Ellerton Vlies, and Sir James Walker, C.B.E., D.Sc., F.R.S.

Allowance of the New By-laws.—Since the preparation and issue of the Balloting List for the election of Council, the Solicitors of the Institute have transmitted from the Lords

of H.M. Privy Council the following Order, allowing the new By-laws of the Institute :

L. S

At the Council Chamber, Whitehall.
The 24th day of January, 1921.

By the Lords of His Majesty's Most
Honorable Privy Council.

WHEREAS the Institute of Chemistry of Great Britain and Ireland, did, in exercise of the power in that behalf conferred on it by the Charter of Incorporation of the Institute, by Resolution of a General Meeting held on the 28th day of October, 1920, make new By-laws for the Institute in substitution for the existing By-laws thereof, and did further by Resolution of a subsequent General Meeting held on the 12th day of November, 1920, confirm the said new By-laws :

And whereas the Institute has, in compliance with the requirements of the said Charter, submitted the said new By-laws, so made and confirmed as aforesaid, to the Lords of the Council for allowance :

NOW, THEREFORE, Their Lordships, having taken the said By-laws (a copy whereof is hereunto annexed) into consideration, are pleased to allow the same.

(Signed) ALMERIC FITZROY.

District Members of Council.—Following the allowance of the By-laws, the Council have prepared a scheme for the election of District Members of Council, particulars of which are here given :—

RULES FOR THE ELECTION OF DISTRICT MEMBERS OF COUNCIL.

I. DISTRICTS.

For the purpose of the election of District Members of Council, the Districts shall for the present be defined, subject to adoption by a General Meeting of the Institute, as follows :—

- (i) Birmingham and Midlands, including the Counties of Hereford, Salop, Stafford, Worcester, Warwick, Derby, Nottingham, Leicester, Rutland, and Northampton.
- (ii) Bristol and South-Western Counties, including the Counties of Gloucester, Wilts, Dorset, Somerset, Devon and Cornwall.
- (iii) Liverpool and North-West Coast, including the Counties of Flint, Westmoreland and Cumberland and so much of the Counties of Chester and Lancaster as lies to the west of the line drawn through the centre of the postal districts of Wigan and Warrington, the towns of Wigan and Warrington and all towns on the line of which the greater portion of the postal district lies to the west of the line, The Isle of Man.

- (iv) London and South-Eastern Counties, including East Anglia, the Counties of Kent, Sussex, Hants, Surrey, Berks, Oxford, Buckingham, London, Hertford, Essex, Bedford, Cambridge, Suffolk, Norfolk, and Huntingdon, and the Channel Islands.
- (v) Manchester and District, including so much of the Counties of Lancaster and Chester as lies to the east of the line drawn through the postal districts of Wigan and Warrington as aforesaid.
- (vi) North-East Coast and Yorkshire, including the Counties of Northumberland, Durham, York, and Lincoln.
- (vii) Edinburgh and West of Scotland, including the Counties of Nairn, Elgin, Banff, Aberdeen, Kincardine, Forfar, Perth, Fife, Kinross, Clackmannan, Stirling, Linlithgow, Edinburgh, Haddington, Berwick, Peebles, Selkirk, and Roxburgh.
- (viii) Glasgow and West of Scotland, including the Counties of Caithness, Sutherland, Ross and Cromarty, Inverness, Argyll, Dumbarton, Renfrew, Lanark, Ayr, Wigtown, Kirkeudbright, and Dumfries.
- (ix) Wales.
- (x) Ireland.
- (xi) The Overseas Dominions, The Empire of India, and abroad.

II. NOMINATION.

Subject to the provisions of By-law 30 (2)—

(1) Any five Members whose registered addresses are within any one District, as defined and adopted by the Institute in General Meeting, may nominate one eligible Fellow as a candidate for election as a District Member of the Council for that District, but no member shall nominate more than one such Fellow; except that the Committee of any Local Section constituted in accordance with By-law 94, 2(a) may, as such, nominate one candidate for such election, or if there be more than one Local Section in a District the Committees of all the Local Sections in that District shall sit jointly for the purpose of nominating one Candidate for such election.

(2) Any nomination made under these Rules shall be delivered to the Secretary at the Offices of the Institute on or before the second Monday in December in the year preceding the date of election, and shall be in the following form:—

“We, the undersigned, Members of the Institute of Chemistry of Great Britain and Ireland, do hereby certify that A.B., of (registered address), a Fellow of this Institute, is, in our estimation, a fit and proper person to be a District Member of the Council of the Institute, and we do hereby nominate him as a candidate for election as a District Member of the Council;

“Except that in the case of District (xi) this rule shall read as if the word ‘August’ were substituted for ‘December.’”

(3) Any such nomination may consist of several documents in like form, each signed by one or more Members.

III. BALLOTING LISTS.

(1) On or before the fifth day of January in any year, the Council shall cause to be sent to every Member in each district in the manner prescribed by By-law 81, a balloting list containing the names of the candidates nominated for election as District Members of Council for such District, and the balloting list shall indicate which, if any, of the candidates has been nominated by the Committee or Committees of the Local Section or Sections in the respective District ;

Except that in the case of District (xi) this rule shall read as if "September" (in the year previous) were substituted for "January."

(2) Each Member desirous of voting—

(a) Shall record his vote for a District Member of the Council by making a cross against the name of the candidate for whose election he desires to vote, but no Member shall vote for more than one such candidate.

(b) Shall deliver or transmit his balloting list in a sealed envelope bearing on the outside the signature of the Member addressed to the Secretary at the office of the Institute, so that it be received not later than by the first post on the third Monday in January in the year for which the election is being held.

IV. SCRUTINY AND ELECTION.

(1) The envelopes containing the balloting lists shall, on the third Thursday in January in the year in which the election is held, be opened by two Scrutineers, not Members of the Council, nor candidates nominated for election as District Members of the Council, who shall be nominated by the Council in December of the year preceding the election at a meeting convened specially for that purpose.

(2) The balloting list of any member who on the third Thursday in January is in arrear with any subscription or other sum payable by him to the Institute under the By-laws shall be disallowed.

(3) The Scrutineers shall present their Report to the Council at a meeting on the third Friday in January specially convened for that purpose.

(4) The candidate receiving the greatest number of votes in each District respectively shall be elected and, in any case of an equality of votes the Council shall decide the matter by ballot.

(5) If at any time after the balloting lists have been sent to members, and before the dissolution of the Annual General Meeting, any candidate who would otherwise have been elected has died or has withdrawn his nomination or has in any way become ineligible for Membership of the Council, then the candidate having the next greatest number of votes shall be elected, or if there be no such candidate, the vacancy shall be filled as provided in Rule V.

(6) The election of District Members of Council shall be notified to members when they are served with the balloting list for the election of General Members of Council at the Annual General Meeting.

V. CASUAL VACANCIES.

After the first election any vacancy among the District Members of the Council occurring between the Annual General Meetings, owing to death, resignation, removal or otherwise, shall be filled by the election by the Committee of the Local Section in the respective District of one eligible Fellow; or if there be more than one Local Section in the District the Committee of all the Sections therein shall hold a joint meeting for the purpose of such election. Notice convening a meeting for this purpose shall be sent by the Secretary of the Institute to all the members of the Committee or Committees of the Section or Sections concerned at least fourteen days before the date of the meeting.

If there be no Local Section within a District, a casual vacancy shall be filled by the election by the Council of one eligible Fellow from the Fellows resident in that District.

If there be a casual vacancy in the case of the District Member of Council for District (xi), such vacancy shall be filled by the Council by the election of one eligible Fellow.

VI. ELECTION.

The first election of District Members of Council shall be held under these rules, except that Rule 2 shall be read as if the word "April" were substituted for "December" and "August," that Rule 3 shall be read as if the word "May" were substituted for "January" and "September," and that in Rule 4 the word "May" shall be substituted for "January," and these words shall be added to Rule 4, "in the election of the first District Member of Council for District (xi) this Rule shall be read as if the word 'July' were substituted for 'January.'"

At an Extraordinary General Meeting to be held on February 28th, the Members will be asked to determine and define the Districts in each of which the members shall be entitled to elect one District Member of Council in accordance with the new By-laws, and the Council will thereupon make arrangements for the first election of such District Members of Council. The list of Districts suggested in Rule I. above, based on the decision of the Conference of Hon. Secretaries of Local Sections held on April 16th, 1920, will be submitted for approval and adoption.

Formation of a Sub-Section.—The Committee has received from the Committee of the London and South-Eastern Counties Section a draft of suggested Rules for the formation of Sub-Sections which shall apply, in the first instance, to the formation of a Sub-Section at Holton Heath. The Council

have approved and have sanctioned the formation of a Sub-Section at Holton Heath, to be termed the Bournemouth and District Sub-Section of the London and South-Eastern Counties Section.

RULES FOR THE FORMATION OF A SUB-SECTION.

1. For the further organisation of the Local Sections of the Institute and the promotion of their objects as well as to maintain the interest of the Fellows and Associates in the general welfare of their profession and of the Institute and to promote social intercourse, the Council will be prepared to receive applications for the formation of Sub-Sections within the Local Sections of the Institute.

2. Applications for authority to form Sub-Sections shall be made in writing in the first place to the Committees of the respective Local Sections. Such applications shall be signed by ten or more Fellows and Associates of the Institute and shall set forth the evidence required by these rules; and the Local Sections, if they deem it desirable, shall forward the same to the Council with an intimation of their concurrence.

3. No Sub-Section shall be formed unless ten members in a District express the wish that such Sub-Section be formed and prove to the satisfaction of the Local Section concerned and of the Council that it is impracticable for them to attend the meetings of the Section.

4. A Sub-Section as a whole shall pay the subscription of a single member to the section funds and in return the Secretary of the Sub-Section shall receive all notices to which members of the Section are entitled.

5. A Sub-Section shall have the right to nominate one member of the Section Committee, who shall be additional to the number of members allowed under the rules of that Section.

6. Any resolution which the Sub-Section wish to be considered by the Council shall be submitted to the Local Section Committee, who will take such action as they think desirable.

7. A Sub-Section shall elect a Secretary and shall organise its business as it may deem desirable, subject to the approval of the Committee of the Local Section.

8. Except as otherwise provided in these Rules, a Sub-Section shall conform with the General Rules laid down for Local Sections of the Institute.

The Institute and New Legislation.—The promotion of the Dyestuffs (Import Regulation) Bill, which is now on the Statute Book, and of the proposed Key Industries Bill, has imposed upon the Council the responsibility of deciding how far it would be possible to frame a policy which would enable them to take action upon any measure before Parliament with regard to which the Members of the

Institute may hold divergent political opinions and yet upon which the Council are entitled to be, and should be, heard in the general interests of the profession of chemistry.

On a motion by Mr. William Macnab, a Special Meeting of the Council was held on 27th January, 1921, to consider this important question.

In opening the discussion, Mr. Macnab referred to the action taken with regard to the glass industry, particularly laboratory glass,—already reported in the Journal, Part VI. 1920,—and expressed his opinion that in all similar matters chemists as a body should consider whether they could take any step to help the country. He agreed with Mr. Ballantyne, who held that in matters upon which there was reason to believe that strong differences of opinion existed among the Members, action which might be held to commit the Institute should be avoided, unless or until the Council had ascertained the views of the Members generally. Although the important part which chemistry played in the war had been recognised fairly well, there was a tendency on the part of the public and politicians to forget the necessity of holding and developing the advance in chemical industry which had been attained. The passing of the Dyestuffs (Import Regulations) Act, 1920, and possibly of other statutes of importance to chemistry rendered it advisable that such a body of chemists as the Institute should keep these matters under the closest observation. Chemists owed it not only to themselves but to the country to ensure so far as they could that chemical industry was actually developed in return for the support or protection received from the State.

Amazing and incorrect statements were frequently put forward by one side or the other on matters of fact which could with advantage be corrected by the Institute, with much greater authority than by private individuals. Both the public and Parliament would thereby be helped. For example, the dye factories had been represented as potential explosives works and, on the other hand, it had been stated that our dye factories made practically no poison gas during

the war, and, therefore, that there was no need for dye works for possible purposes of war, as the manufacture of poison gas during the war had been carried out in old established chemical works. These were both misleading statements, although they contained grains of truth. Recently too we had been told about the unsuitability of this country for the manufacture of dyes, on account of its sodium laden atmosphere !

It was true that many nitro bodies which could be used as explosives could be made in the dye works with little or no alteration of the plant ; but the experience in this country, as well as in France and Germany, showed that it was most unwise to make such explosives in the heart of a closely assembled works, on account of the risk of explosion. It was therefore misleading to speak as if the existence of well-equipped dye factories provided ready-made explosives works. Such an industry, however, provided a large reserve of chemists and workmen, experienced in the manufacture of nitro compounds, which would be a national asset should a call for explosive nitro bodies be made. Should it be necessary again to manufacture poison gases, the main asset would be the experience gained in conducting the manufacture of varied organic compounds with the complicated operations often involved.

The dye industry, if well developed, could be of the greatest help to the nation if a necessity arose for " chemical warfare " ; but it was hateful to chemists that they should have been called on to produce such abominations as were used during the war or to contemplate making them again. However it was better for all mankind that the spirit which animated the enemy did not emerge triumphant even though we had been compelled to hit back with the vile weapons used against us. Chemists hoped the League of Nations would be able to prevent such prostitution of their science in the future.

The scientific and technical ability in this country would prove equal to any demands made on it, if it were given a fair chance ; but any industry which received a measure of

assistance from the State must loyally support its scientific and technical leaders in their efforts to develop and put the industry on a well-secured foundation of knowledge, and adopt a wide and far-seeing outlook without which national success could not be attained. Directors must recognise the supreme importance of devoting an adequate proportion of profits to research. It was much to be hoped that those concerned in the direction of any assisted industry would be stimulated by a proper patriotic feeling in the matter and act up to it. Many people would heartily welcome any light and leading which the Institute could give when occasion arose, and it was the duty of chemists patiently to determine how they might best help the industries to make the most of their opportunities in order to ensure to the nation the satisfactory development of our chemical industries.

Clause 6 in the Dyestuffs Act, providing for the constitution of a Committee for the purpose of advising the Board of Trade with respect to the efficient and economical development of the dye-making industry, would appear to afford some protection to the State and should be carefully considered by the Legal and Parliamentary Committee of the Institute.

The Institute as a body had no legal standing to ensure that the desired progress was made, but it might very usefully help to guide and form public opinion in these most important matters. One Member of Parliament who voted against the Bill, but strongly desired to see the dye industry well established, had told him (Mr. Macnab) that he was sure statements of fact from the Institute on opportune occasions would be of the greatest assistance to Members of the House.

The Dyestuffs Act was already in existence and other Acts involving chemical industry might follow. Chemists being deeply interested and concerned in the chemical industries of the country, it was their duty to do all in their power to help existing legislation to a successful issue and see that any future legislation did not rest on wrong chemical premises.

The Institute had a great opportunity of serving the country and benefiting its members in connection with

chemical interests and the State. The public and Parliament were badly in need of education in matters relating to chemists and chemistry. He (Mr. Macnab) felt strongly that the existence of the Dyestuffs Act and the further discussions on matters touching chemical industry which were certain to take place in Parliament would provide many occasions on which chemists could make their voice heard effectively and with advantage to all concerned. They should, therefore, seize suitable opportunities as they arose and act boldly.

In the course of the discussion which followed, the views expressed by Mr. Macnab were generally endorsed by the Council.

The President said that the action taken by the Institute in 1914 with regard to the requirements of chemists—reagents, and chemical glassware and porcelain—and subsequently in many matters connected with the war, had clearly indicated that it was ready to be useful to the country in an emergency. The spirit of the position it had then assumed in public matters should be maintained in dealing with other problems as they arose, having regard to the public interest and the wishes of the members generally, with a view to bringing together, when possible, manufacturers and consumers for their common benefit; correcting prevalent mistaken notions regarding chemists and their work, and in any event avoiding political party bias.

A Special Advisory Committee to deal with the whole question was appointed, consisting of the President and the Hon. Treasurer, with Messrs. Horatio Ballantyne, O. L. Brady, F. H. Carr, A. Chaston Chapman, F. W. Harbord, E. M. Hawkins, C. A. Hill, P. H. Kirkaldy, Gilbert T. Morgan, William Macnab, F. M. Potter and Sir Robert Robertson.

The Remuneration of Public Analysts.—The Public Appointments Committee has reported to the Council on the remuneration of Public Analysts in 1914 and in 1920, respectively (see p. 52).

In the first place, the Committee considered the conditions of appointment of Public Analysts, who are engaged as whole-time officials by their authorities, and provided with laboratory staff and equipment. The Committee hold that such officials when retained by comparatively small boroughs should receive emoluments at least on the scale adopted by the Government in connection with work requiring like qualifications. For the present, this scale carries a basic salary of £450 rising by annual increments of £25 to £650 and prospect of promotion, together with the existing Civil Service War Bonus. When the analyst is retained by a county council or local authority of a large borough, the remuneration should be commensurate with the responsibility.

With regard to appointments in which the remuneration is made by fee per sample, the Committee feel that although in the majority of instances the local authorities have increased the fees, the average fees are still considerably less than they should be in the prevailing circumstances.

Public Analyst for Brighton.—The attention of the Councils of the Institute of Chemistry and of the Society of Public Analysts has been directed to the conditions offered for the appointment of Public Analyst for the County Borough of Brighton.

The local authority offered a salary of £50 per annum, with 5s. for the analysis of each sample of milk and 10s. 6d. each for the analysis of other samples. The Councils informed the local authority that this remuneration was far below that generally obtained by Public Analysts in Great Britain. Assuming a reasonable proportion of samples of milk, and allowing for the salary of £50, it appeared that the average fee per sample was not more than 8s. 6d., while the average fee paid by all authorities throughout the country was approximately 15s.

The Councils reminded the local authority that—apart from the advanced cost of living—the cost of assistance, apparatus and materials had more than doubled. All of this had to be borne by the Analyst, and would render it practically impossible, on the remuneration proposed, for him to carry

out the duties of the office satisfactorily and with any margin of profit to himself. Public analysts whose qualifications had already been approved by the Ministry of Health had declined to become candidates for the appointment. The number of candidates likely to apply for the appointment was, therefore, limited in a manner which was not in the best interests of the proper administration of the Sale of Food and Drugs Acts.

The Councils of the Institute and of the Society expressed the hope that the local authority would consider the revision of the conditions before proceeding further with the appointment.

A letter was also addressed to Public Analysts and others likely to be interested in the matter, stating that the Councils hoped that they would refrain from applying for the appointment, or, if they had already made application, would withdraw their candidature until the terms had been improved.

Gas Examiners.—The Public Appointments Committee has given further consideration to the qualifications which are desirable for gas examiners under the Gas Regulation Act, 1920. While agreeing that the present tests required to be made under the Act are not essentially chemical and that the qualifications of a gas examiner need only a moderate training in chemistry and physics, the Committee anticipates that the testing of gas may in the near future be extended to include more definite chemical work. In those circumstances, it would be desirable that the work should be entrusted to qualified chemists, and that, wherever possible, the Board of Trade should advise local authorities with regard to the qualifications of such chemists, following the principle adopted by the Ministry of Health in dealing with the qualifications of Public Analysts.

The Board, however, has not issued any orders or regulations to local authorities regarding the method of procedure which is to be followed in appointing gas examiners, and it is not the intention of the Board to indicate in any way to local authorities the qualifications required in respect of such appointments.

The Chief Gas Examiner and the Gas Referees, on the other hand, are vested with considerable powers, and will without doubt take steps to ensure that work of a technical character, such as the determination of carbon monoxide and of inert gases, shall be entrusted only to chemists with the necessary skill and experience. In any case it is unlikely that such testing will be required until after the two Committees recently appointed by the Board have reported.

Coal Mines Regulations.—The attention of the Committee has been directed to the General Regulations issued under Section 86 of the Coal Mines Act, 1911, requiring the analysis of coal mine dust. Certain persons and companies are said to have circularised colliery owners offering to analyse samples of dust, under the terms of the Regulations, at a fee of 5s. each. Apart from the objection to such circularisation from the professional point of view, the sampling and analysis are operations of considerable responsibility, and the Council have decided therefore to communicate with the Mines' Department, Board of Trade, with the Miners' Federation of Great Britain, and with the Colliery Owners' Association, in order to impress upon them the importance, from the point of view of the safety of human life, of having the sampling and analysis of these dusts, and also of the oxygen used in connection with breathing apparatus, conducted by qualified analysts.

A New Food Bill.—The Food Controller proposes to consult the Councils of the Institute and of the Society of Public Analysts when he is framing, early next session, a Food Bill, to deal, *inter alia*, with the misdescription and the regulation of the quality of foodstuffs. The Councils have asked the Controller whether they may be allowed to see a draft of the Bill or at least a draft of the headings of the Bill, and have offered to appoint representatives to discuss proposals with regard to the measure with the Controller.

Public Analysts are invited to forward to the Registrar of the Institute any unusual and glaring examples of misdescription of foods, and particulars of difficulties with which

they have had to contend owing to the lack of standards and definitions of food products.

Dyestuffs (Import Regulation) Act.—The Legal and Parliamentary Committee has considered the Dyestuffs (Import Regulation) Act, 1920.

Sections 1 and 2 of the Act are as follows :—

1.—(1) With a view to the safe-guarding of the dye-making industry, the importation into the United Kingdom of the following goods, that is to say, all synthetic organic dyestuffs, colours and colouring matters, and all organic intermediate products used in the manufacture of any such dyestuffs, colours, or colouring matters shall be prohibited.

(2) Goods prohibited to be imported by virtue of this Act shall be deemed to be included among the goods enumerated and described in the Table of Prohibitions and Restrictions Inwards contained in section forty-two of the Customs Consolidation Act, 1876, and the provisions of that Act and of any Act amending or extending that Act shall apply accordingly.

2.—(1) The Board of Trade have power by licence to authorise, either generally or in any particular case, the importation of any of the goods, prohibited to be imported, by virtue of this Act.

(2) A licence granted under this section shall not be transferable.

(3) For the purpose of advising them with respect to the granting of licences, the Board shall constitute a committee consisting of five persons concerned in the trades in which goods of the class prohibited to be imported by this Act are used, three persons concerned in the manufacture of such goods, and three other persons not directly concerned as aforesaid.

Such one of the three last-mentioned persons as the Board shall appoint shall be chairman of the committee.

(4) If on an application for a licence under this section the committee are satisfied that the goods to which the application relates are goods wholly produced or manufactured in some part of His Majesty's dominions, a licence shall be granted in accordance with the application.

(5) An applicant for a licence shall be entitled to object to any member or members of such committee dealing with his application on the ground that he is prejudiced, owing to the fact that such member or members is or are trade competitors, and, if such objection is sustained by the Committee, the member or members so objected to shall withdraw from further consideration of the case, and shall not have access to any information or documents concerning it.

(6) For the purpose of advising them with respect to the efficient and economical development of the dye-making industry, the Board shall constitute a committee of persons concerned in the trades of dye-maker or dye-user and of such other persons not directly concerned in such trades as the Board may determine.

(7) For the purpose of providing for the expenses incurred by the Board in carrying this Act into execution, the Board may charge in respect of a licence a fee not exceeding five pounds.

The Committee has considered the effect of the Act on the provision of adequate and reasonably-priced supplies of chemicals for research purposes, being apprehensive as to the interpretation which may be put upon the phrase "all organic intermediate products used in the manufacture of any such dyestuffs, colours, or colouring matters." The Council have thereupon addressed an enquiry to the Board of Trade in order to ascertain whether it is necessary to obtain a licence for the importation of small quantities of such chemicals,—even though they are capable of being used as intermediate products in the manufacture of dyestuffs, colours, or colouring matters,—provided that there is no intention that they shall be so used. In reply, the Board states that:—

"Whilst it is not possible to regard small quantities of organic intermediate products which may be required for research purposes as being outside the scope of the Act, the Board will be prepared to issue general licenses for the importation of such products to approved research institutions, covering periods of three months and limited only as to total quantities. This procedure will obviate the necessity for separate applications for a large number of small items, but it will be a condition of the issue of any general license that a detailed return shall be furnished at the end of the three months during which the license is in operation, of the quantities of each product actually imported under it."

Schedule of Professional Fees.—In March, 1913, the Public Appointments Committee prepared a draft schedule of professional fees. This schedule was submitted to the Council, and it was agreed that it should be kept at the office of the Institute to enable the Registrar to answer enquiries from members with regard to professional charges. The incidence of the war has rendered it necessary to revise the fees, and the Committee having obtained opinions from practising members in various parts of the country has prepared a new schedule to be substituted for that prepared in 1913; on the understanding, however, that reference shall be made from time to time to well-established practitioners to ascertain whether any modification is desirable in any particular case.

The Remuneration of Chemists.

IN publishing, in Part I. of the *Journal* for 1920, statistics as to the salaries and conditions of employment of chemists, the Council anticipated that their action would be of considerable service to individual chemists and to the heads of chemical departments when approaching their directors or authorities with regard to the subject of salaries, as well as to employers themselves. In order to confirm this expectation and to obtain statistics which might extend the utility of the investigation, the Council issued, in August, 1920, a second circular inviting further returns from Fellows and Associates in whole-time appointments.

Replies were received from 917 chemists (including 25 women) resident in Great Britain and Ireland, of whom 616 were Associates and 301 Fellows. Seventy replies were also received from chemists employed in Overseas Dominions. In view, however, of the widely varying conditions of living and rates of exchange, these have not been included in the table below, although they will no doubt be useful in answering enquiries from chemists who propose to take up appointments abroad.

The remarks attached to the returns indicated in many cases that the schedule previously published had been directly useful. Indeed, information has been received that it had been particularly referred to in connection with a range of important official appointments recently modified in favour of the chemists concerned, and also in respect of the staffs of several large industrial companies. In very few instances have members expressed themselves as seriously discontented.

The following figures show the present average rate of pay received by Fellows and Associates at the age of 30, compared with that received in 1919 :—

	1919	1920	
In Industry ...	£410	£525	with annual increments of £24
„ Govt. Service ...	£350	£450	„ „ „ „ £15
„ Teaching Work	£285	£390	„ „ „ „ £15
„ all branches ...	£380	£480	„ „ „ „ £22

The attached tables also show that the higher grade of the Fellowship obtains distinct material recognition in every branch of work. At the age of 30, for instance, the average salary of Fellows in whole-time appointments generally is about £550 ; in industry, £590 ; in Government Service, £510, and in teaching, £440. The value of Fellowship, moreover, is emphasised at the later ages, and this should afford encouragement to Associates to prepare for advancement to the senior grade. In all branches of the profession, however, there is clear evidence of the success of Fellows who have taken the trouble to supplement their university degrees by passing the Institute examinations.

The Council again regret that the number of members who have assisted them in this enquiry was not greater, and that the figures, therefore, although correct and useful so far as they go, cannot be taken to represent the exact state of affairs. For the reasons which are indicated hereunder it is clear, however, that the tables understate the position.

The comments of members will be briefly summarised according to the branches of work in which they are engaged.

Industry.—Replies were received from 637 members (467 Associates and 170 Fellows) engaged in industry ; of these over 630 were under 50 years of age. The returns show a considerable improvement on those of the previous year ; the average salary has increased, age for age, by sums varying from £90 to £140, while actual dissatisfaction is seldom expressed. Less than half of the chemists in industry

have made any mention of the terms of their contracts, and very few show that the terms are harsh. There are, however, cases where chemists are unable to secure their proper status, where they are subject to illogical restrictions, or are rigorously debarred from opportunities of showing initiative in applying their knowledge to the best advantage. In at least one such case it is clear that the worth of the chemist is deliberately denied adequate recognition for fear of creating jealousy in the non-technical staff. On the other hand, the majority of industrial chemists are looked to for the suggestion of improvements in operations and management, and are frequently rewarded either by lump sum payments, by a bonus on profits, or by allotment of shares in the company, or are definitely permitted to exploit their own inventions. In other instances, however, the suggestion of improvements is accepted as part of the normal day's work, for which no special consideration is accorded.

The case of the chemist employed only for purposes of research is somewhat different, as the search for improvements is the sole reason for his employment. Some chemists take the view that they cannot properly claim additional consideration when their researches prove unexpectedly remunerative to their employers, since they or others may do equally good work for months, or even years, obtaining results negative in character, which are not translatable into monetary values. They feel that, where the conditions of appointment are good, their salaries are adjusted to compensate them for waiving any pecuniary award in the way of royalties for their discoveries, and that this system is in the best interests of research and of effective team work. Others, however, feel that they should receive a special award for any discovery they may make, and the returns show that many research chemists are given a financial share in royalties from patents which are utilised by others than the employing firm, and even for those worked by the employing firm after the expiration of their agreements.

Many chemists are engaged at a definite salary with a fluctuating bonus according to results achieved. Several returns contain no mention of the amount of such bonus, so that the average in the tables is correspondingly lower than it would have been.

Many contracts contain a clause restraining the chemist from practising in a similar branch of industry for a definite period. Generally the time and area of restraint are reasonable, varying from one to three years and within small defined areas. Instances occur, however, where perpetual and almost world-wide restraint is attempted. Often the chemist is to be compensated during a period of forced inactivity by the payment of an allowance varying from a quarter to two-thirds of the amount of his salary received during the last year of his employment.

The question of the publication of scientific work is variously treated. Some firms are apparently unduly secretive and forbid any publication; but while admitting that occasionally a firm may have good ground for concealing a discovery from its competitors, such a course imposes hardship on chemists when they are not allowed to submit records of their work as theses for doctorate degrees of the Universities, or as evidence in support of their claims for the Fellowship of the Institute. As a contrast, one case may be mentioned where the firm allows a chemist to devote two days a week to research of academic character with the definite object of presenting it as a thesis for a degree.

The majority of contracts are for two or three years, and require the whole of the chemist's time, at a definite salary, although in a few cases allowance is made for additional remuneration during periods of unusual pressure and, in others, the chemist is allowed to undertake independent consulting work or to hold concurrent teaching appointments. A few salaries are paid income tax free and several appointments carry free quarters or house, and sometimes light and fuel. Many posts are pensionable. Several employers give their chemists time for attending meetings of scientific bodies and pay their expenses in connection therewith.

An increasing number of chemists earn their living in vocations requiring other than scientific qualifications: for instance, as general managers, sales managers, and managers of factories and departments in industrial establishments and works. The statistics of average salaries of qualified chemists in industry must, in any event, be interpreted with caution, since the worth of brains and initiative cannot easily be appraised, nor the value of services compared and classified.

Government Service.—The improvement in the position of chemists engaged in Government Service is due largely to the award of the recent Civil Service Bonuses, and has in some cases arisen through the reorganisation of the departments concerned. In some departments reorganisation is still pending, so that it is not unlikely that in the near future the figures for Government Service will be further enhanced. The hours of working and periods of leave are, on the whole, more favourable than in industry, and no return shows evidence of discontent on that account, but some are doubtful as to prospects of promotion, especially holders of temporary appointments, who are desirous that their positions should be placed on a permanent footing. When the figures for Government Service are plotted on curves, distinct flattenings are apparent at periods where chemists have reached the limit of salary attainable in a particular grade, and are awaiting the occurrence of a vacancy before obtaining promotion.

Only 45 returns were received from chemists engaged in whole-time municipal or other public employment, and it would be inadvisable, therefore, to draw any definite deductions from the figures given. It may be remarked, however, that whereas in one or two appointments the conditions compare favourably with those in Government Service, the average salary is about £50 lower.

Teaching.—The figures for teachers of chemistry, though comparing unfavourably with those of other branches of the profession, show considerable improvement upon those

published last year. 208 replies, of which 142 were from Associates, were received from teachers of chemistry. This high percentage of the total returns from a relatively small branch confirms the fact that teaching is less remunerative than other branches. Of the Associates 55 were teaching in public and secondary schools. In the junior positions the difference in the emoluments of those teaching in schools and in universities and technical colleges is insignificant. Moreover, the position at the time the returns were received was not so favourable as it is to-day, since many authorities have now adopted the recommendations of the Burnham Committee. The salaries of teachers in technical schools and in university colleges are now under the consideration of a similar committee, and it is to be hoped that in the near future these salaries will be so improved as to continue to attract good chemists to this essential branch of the profession. In many cases complaint is made of understaffing in colleges, which is largely due to the influx of ex-service students, while the additional pressure of work thereby involved leaves little time for research. Lecturers are often expected to undertake a certain amount of evening work, and in some cases this is specially remunerated; in others, evening work is a definite part of the conditions of employment.

Women Chemists.—The average rate of pay of women Fellows and Associates is in every case less than the average received by men of the same age. Similarity of treatment is more nearly accorded in Government Service where younger women chemists receive only 3-7% less than the average salary of men in the same grade. In industry women start at a disadvantage of about 15%, and this is increased with increasing age. Teaching posts for women are also less remunerative to the extent of 6-30%.

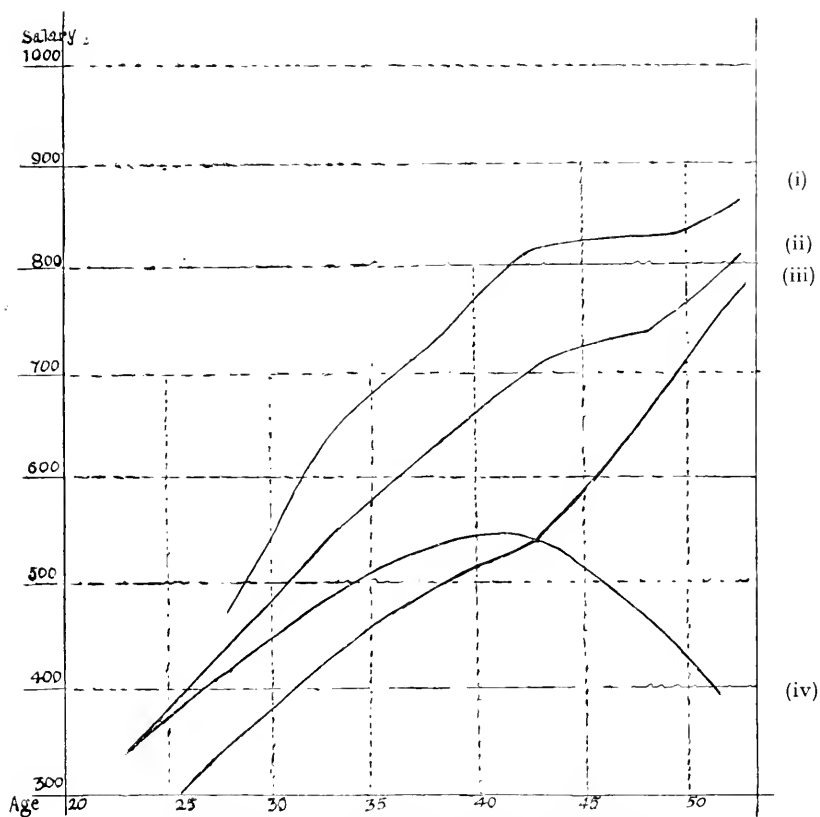
The general position at present seems to be that women chemists are paid a slightly lower initial salary than men, and their prospects of promotion are much more limited.

SUMMARY OF PAY STATISTICS RECEIVED FROM
CHEMISTS EMPLOYED IN GREAT BRITAIN AND
IRELAND.

AVERAGE SALARY INCLUDING BONUS.

<i>Age.</i>	<i>Industry.</i>	<i>Government</i>		<i>Teaching.</i>	<i>Average.</i>
		<i>Service.</i>			
	£	£		£	£
21-25	337	358		299	332
26-30	455	394		334	427
31-35	604	504		423	551
36-40	676	534		546	622
41-45	911	841		503	807
46-50	668	796		742	717
<i>A.I.C.</i>					
	£	£		£	£
21-25	337	358		299	332
26-30	444	378		326	416
31-35	555	432		377	508
36-40	599	439		432	536
41-45	551	550		526	545
46-50	491	350		450	455
<i>F.I.C.</i>					
	£	£		£	£
26-30	528	469		410	503
31-35	708	633		495	635
36-40	747	581		636	694
41-45	1055	906		483	916
46-50	710	852		761	757

REMUNERATION OF FELLOWS & ASSOCIATES OF THE INSTITUTE IN 1919 & 1920



(i) Fellows (1920); (ii) Fellows and Associates (1920);
(iii) Fellows and Associates (1919); (iv) Associates (1920).

Remuneration of Public Analysts.

THE Councils of the Institute of Chemistry and of the Society of Public Analysts have invited Public Analysts to provide data as to the remuneration and other conditions of their appointments in 1914 and in 1920 respectively.

Replies were received in respect of 140 appointments in England and Wales and in respect of 102 appointments in Scotland; of these, 9 and 1 respectively were held by whole-time officers.

PART-TIME OFFICIALS.

Public Analysts receive remuneration in various ways :—

- (A) by payment of an agreed fee per sample,
- (B) by payment of an agreed salary, which is intended to cover the analysis of all samples of Foods and Drugs,
- (C) by payment of a retaining fee, together with an agreed fee for each sample of Foods and Drugs,
- (D) by payment of a retaining fee or salary in consideration of the analysis of an agreed number of samples and by fee for the analysis of all samples in excess of that number.

The number of appointments held under each of the above classifications was :—

			<i>England and Wales.</i>	<i>Scotland.</i>	<i>United Kingdom.</i>
(A)	..	..	56	26	82
(B)	..	..	7	2	9
(C)	..	..	63	59	122
(D)	..	..	5	14	19
			—	—	—
			131	101	232
			—	—	—

For the purposes of comparison, the total actual remuneration (including the proper proportion of the salary or retaining fee) for the analysis of each sample was calculated. The

figures for the average remuneration are included in Table A (below), which shows the remuneration received in 1914 and 1920 respectively. The table shows also the average remuneration per sample which applies to those appointments of which the conditions have remained unaltered since 1914, and the average remuneration of those in which the fee, retaining fee, or salary has been increased.

In a few cases in which the retaining fee or salary had not been altered since 1914, a reduction in the number of samples caused the remuneration per sample to increase, whilst the payment received by the Analyst had remained stationary, or had decreased. These appointments were treated in the tables as if their terms had remained unaltered.

Table B shows similar figures for the more important appointments (from which at least 100 samples were received during 1920).

Owing to the disturbed state of Ireland no useful data can be given for that country.

WHOLE-TIME OFFICIALS.

Replies were received from 10 whole-time salaried analysts. Of these 5 were required to perform analyses of samples other than Foods and Drugs, together with bacteriological examinations. The salaries of the other officials varied according to the number of samples submitted, but there was no possibility of assessing an average salary according to the number of samples.

The following table will, however, serve as a rough guide :—

	<i>Average salary</i>		<i>Average Increase</i>
	<i>in 1914.</i>	<i>in 1920.</i>	<i>per cent.</i>
Appointments with less than 1,500 samples (of all kinds) per annum ..	£287	£658	129
Appointments with more than 1500 samples (of all kinds) per annum ..	£620	£1036	67

TABLE A.
(ALL APPOINTMENTS.)

Total remuneration per sample of Foods and Drugs submitted to Public Analysts.

(Average from 232 appointments—131 in England and Wales, 101 in Scotland.)

		<i>United Kingdom.</i>	<i>England and Wales.</i>	<i>Scotland.</i>
		Average.	Average.	Average.
Fees in 1914	..	10s. 6d.	11s. 0d.	9s. 10d.
Fees in 1920	..	15s. 8d.	14s. 6d.	17s. 4d.
Fees which have not been increased since 1914	.. ..	12s. 10d.	12s. 11d.	12s. 9d.
Fees which have been increased since 1914		16s. 2d.	14s. 11d.	17s. 8d.
(1920)	(The fees have not been increased in the cases of 34 appointments in England and Wales and 12 appointments in Scotland.)			

TABLE B.
(APPOINTMENTS FROM WHICH THE SAMPLES IN 1920
EXCEEDED 100.)

Total remuneration per sample of Foods and Drugs submitted to Public Analysts.

(Average from 98 appointments—86 in England and Wales, 12 in Scotland.)

		<i>United Kingdom.</i>	<i>England and Wales.</i>	<i>Scotland.</i>
		Average.	Average.	Average.
Fees in 1914	..	10s. 7d.	10s. 8d.	10s. 3d.
Fees in 1920	..	14s. 8d.	14s. 3d.	17s. 2d.
Fees which have not been increased since 1914	.. ..	12s. 1d.	12s. 1d.	—
Fees which have been increased since 1914		15s. 1d.	14s. 9d.	17s. 2d.
(1920)	(The fees have not been increased in the cases of 17 appointments in England and Wales. They have all been increased in Scotland.)			

Local Sections.

London and South Eastern Counties Section.—The Annual General Meeting of the Section was held at the Institute on December 15th, when the Committee and Officers for the ensuing session were appointed.

An informal dinner, which was well attended, was held at the Imperial Hotel, Russell Square, on the same evening ; and the meeting was followed by a short smoking concert which was heartily appreciated.

The monthly meeting of the Section was held at the offices of the Institute, on January 19th, being preceded by the usual informal dinner at the Imperial Hotel.

Mr. W. G. M. Young opened a discussion upon "The Institute of Chemistry: what it can do, what it cannot do, what it should do, and what it should not do." Mr. Young said that the main function of the Institute was to act as an examining and registration body. He did not think that the Institute could assume the functions of a trade union, at any rate so long as it wished to hold a Royal Charter. Whether or not the Institute were in sympathy with the idea of a professional trade union was a point which might be debated on a future occasion. He felt, however, that the Institute should at all costs avoid taking any step which was likely to lower the standard of professional competency and should not therefore in any way relax its examinalional qualifications. There were some who claimed that the examinations were superfluous ; in his opinion, they provided a test of competency to practise in the profession of chemistry which was not provided by any other examination authority in the country.

The Registrar was then called upon by the Chairman, but he said that he would rather defer his remarks in order to reply to any criticism which might be levelled at the Institute. He was prepared to defend the view that the Institute had done and was doing what it could, and had not done anything it could not or should not. In the early days of the war, criticism was levelled at the Institute for taking over duties which it was alleged were not properly its duties. He claimed, however, that it had done work which needed to be done and had not, in any way, over-stepped its privileges.

Mr. C. L. Claremont was of opinion that the Institute, in the first place, was formed only for those who practised as consulting and analytical chemists, such as public analysts. He deplored that the Institute, in enlarging its membership, had applied tests other than its own examinations. He compared the profession of chemistry with that of medicine and suggested that the Council should decide whether it wished to adopt the functions of the General Medical Council or those to the British Medical Association which, in his opinion, adopted trades union principles. He was not well acquainted with the latest regulations, but, in his opinion, a Fellow elected under the old regulations was at a disadvantage. He thought that it was wrong to grant the Associateship on an examination which did not constitute a specific qualification to practise chemistry.

Mr. C. E. Barrs was of opinion that in view of the ever widening scope of the science of chemistry it was essential for the chemist to specialise in a branch of the subject, and he welcomed the examination for the Fellowship which had recognised this fact.

Mr. Collett, the Hon. Secretary, said that as the defence of the Institute was apparently more strongly represented than the attack he wished to constitute himself, in the first place, a "devil's advocate," and mentioned criticisms of the policy of the Institute which he had heard expressed. He later said that what the Institute could do—rather, what it wished to do—was governed by the Charter; and said that

all the members should work together in order to hold the profession together. He feared that far too many members took little interest in professional matters, while others criticised without taking the trouble to find out what was going on, and did not even read their Journal. He felt very strongly the great value of the Local Sections in binding members of the Institute into a compact body which could do useful service for the State, for the profession, and for the individual.

Mr. A. J. Chapman congratulated the Institute upon its efforts to help laboratory assistants. He also suggested that the Council should consider the advisability of the President and Registrar giving lectures to students in the course of their training at college, advising them on points of professional interest and on their prospects of success in the profession.

Mr. C. S. Grace called for the unity of the profession and hoped that the Institute would work in sympathy with the trade unions which had recently been formed. He was of opinion that the Charter should, if necessary, be enlarged in order that this might be done.

Mr. J. B. P. Harrison claimed that what the Institute could or could not do was clearly expressed in the Peterson Judgment in the case in which a chartered body had claimed the privilege of *ultra vires*. The learned judge, however, had decided against this doctrine. He felt that there was room for a trade union of chemists, but that the Institute could not take part in the functions of trade unions, and in this matter he thought it was to be congratulated on the limitation of its objectives.

Mr. F. H. Carr suggested that the title of discussion was too wide: "What the Institute can and cannot do" were one and the same subject. He held that the Institute had ideals and that it acted up to these ideals in that it was always striving to raise the standard of attainments of those engaged in the profession of chemistry.

Mr. E. M. Hawkins claimed that the Institute had carried through a definite constructive policy. It was endeavouring to strengthen the hands of the individual who would help himself. He suggested that the Institute should make an appeal to professors of all colleges to put all their students into touch with the Institute with a view to strengthening the profession. Grievances in a profession arose chiefly when there were half-trained or half-competent men clamouring for admission.

Dr. O. L. Brady reminded the meeting that it was very unwise for a layman to endeavour to apply a judicial decision to an apparently similar case, and at all events he did not think that Mr. Justice Peterson's decision was exactly what Mr. Harrison had stated. With regard to the question of the formation of a trade union, he reminded the meeting that the main object of a trade union was to act in restraint of trade. This action was impossible for a chartered body which had to fulfil obligations to all sections of the community. The Institute could advise its members what to do in certain emergencies, but it had no power to penalise them, as a trade union could do, if they refused to take that advice. A trade union of chemists could boycott individuals or call strikes, but he very much doubted whether it was the wish of members to exercise this power of the mob, which frequently led to grave injustice. With regard to the question of representation on Whitley Councils, he felt that in this matter chemists as a body, by reason of the smallness of their numbers, whether combined or otherwise, were comparatively powerless. He felt that far more influence could be exercised by indirect means.

With regard to the suggestion that the Institute should absorb other organisations, he reminded the meeting that this might necessitate the forfeiture of the Charter and might take away from members the sole right to the use of the words "Fellow, or Associate, of the Institute," which implied their professional qualification. He hoped that one day steps would be taken to limit and close the profession, but it was

necessary first to persuade Parliament that it was in the interests, not of chemists, but of the general public, to do so. He felt that too much stress was laid upon the idea of re-defining the title "chemist." This title had been misapplied to another calling, but great opposition would be raised, both inside and outside of Parliament to any alteration of the law. He felt that members had not considered even such a primary matter as the expense of altering shop fronts, labels, etc. This expense clearly could not be put upon the body of men who were being deprived of what was now their legal title.

He thought that the present meeting was an attempt to crystallise criticism of the Institute. Attempts were being made by articles in the Journal to meet criticisms as they arose. He hoped, therefore, that members who had grievances would communicate them at once to the Registrar, who would see that they received the attention of the Council. He did not agree with the earlier speakers who felt that the new members had entered the Institute under easier terms than the old. He thought that the Institute was quite right in recognising that an honours degree now involved a thorough training in practical chemistry and therefore implied competence to practise the profession of chemistry.

Mr. Young and the Registrar referred to some of the remarks which had been made, the latter stating that, in his experience, the majority of the pre-war Associates and Fellows were doing very well, whilst the Institute's qualifications were being more and more recognised by industries and firms. With regard to Mr. Chapman's suggestion, he said that he had frequently spoken to students, both at the Institute and at their colleges, and he hoped that there would be more frequent opportunities of bringing before them the professional aspects of the calling they proposed to adopt.

The Honorary Secretary stated that the Committee would consider the views which had been put forward at the meeting and draft some constructive suggestions for consideration at a future meeting of the Section.

Manchester Section.—The present Session has been marked by a very considerable increase in membership and by a hearty interest in the work of the Section.

Mr. L. E. Vlies has been unanimously re-elected Chairman, and Mr. James Barr has been appointed Hon. Secretary, on the resignation of Mr. David Cardwell.

At the invitation of the Chairman, about 75 members were present at a social evening on January 26th, in the rooms of the Manchester Literary and Philosophical Society. The Chairman and members welcomed the Registrar, who expressed the regret of the President and of the Assistant Secretary on their being unable to accept the invitation. The Registrar also said that the Council were glad to note the activity of the Section and appreciated its helpful suggestions. He referred briefly to the consideration given by the Council to the Peterson judgment and informed the Section that, although he had reason to believe that the Privy Council would shortly allow the new By-laws, it would not be possible to arrange for the forthcoming election of the Council under the new scheme. The Council, however, would arrange for the election of District Members as soon as possible.

An excellent programme of vocal and instrumental music and recitations was much enjoyed.

Edinburgh and East of Scotland Section.—An Ordinary Meeting of the Section was held on November 4th, 1920, at the Cockburn Hotel, Edinburgh, Dr. T. W. Drinkwater presiding.

Mr. Robert Bruce, M.C., read a paper on "The Chemist in Warfare," in which he gave an interesting account of the directions in which the services of chemists had been utilised in the field. He referred to the various compounds which had been used in offensive operations, and described briefly their physiological properties. He then discussed the means which had been adopted to counteract the effects of these bodies, and exhibited different types of respirators and gas masks designed for this purpose.

A discussion followed, in which Messrs. Stevenson, Wheatley, Watson and Findlater took part.

The Annual General Meeting was held on December 15th, 1920, Dr. T. W. Drinkwater presiding. The report of the Committee for the session 1919-1920 having been received and adopted, office bearers for the ensuing session were elected as follows :—Chairman, Dr. Leonard Dobbin ; Vice-Chairman, Dr. A. Lauder ; Hon. Secretary and Treasurer, Mr. B. D. W. Luff ; Committee, Mr. R. Bruce, M.C., Dr. T. W. Drinkwater, Mr. R. H. Findlater, and Mr. W. A. Williams.

The Secretary reported that a joint sub-committee consisting of members of the Local Sections of the Institute and of the Society of Chemical Industry had been considering the question of establishing a Scientific Club in Edinburgh. A discussion followed, in the course of which Mr. C. Norman Kemp brought forward a proposal for negotiating with a prominent Edinburgh Society for the acquisition of premises which would form an admirable headquarters for an organisation such as that contemplated. The proposal was received very favourably, and the Secretary was instructed to bring the matter to the notice of the joint sub-committee at their next meeting.

Personal.

Sir Robert Robertson, K.B.E., a Vice-President of the Institute, has been appointed Government Chemist in succession to Sir James J. Dobbie, Past President, retired.

The Board of Trade have lately announced the appointment of Sir Richard T. Glazebrook as Chief Gas Examiner, and of Prof. C. Vernon Boys, Dr. J. S. Haldane, and Mr. W. J. Atkinson Butterfield as Gas Referees. The Board have also appointed a Committee including Dr. T. Gray "to enquire whether it is necessary or desirable to prescribe any limitation of the proportion of carbon-monoxide which may be supplied in gas used for domestic purposes," and a further Committee, of which Mr. Butterfield is a member, "to enquire whether it is necessary or desirable to prescribe any limitations of the proportions of incombustible constituents which may be supplied in gas."

Obituary.

JOHN CANNELL CAIN died at Brondesbury on January 31st, 1921, in his 50th year. He was trained at Owen's College, Manchester, and having graduated as B.Sc. (Vict.) with first-class honours in chemistry, proceeded to Tübingen University, where he obtained the degree of Ph.D. Subsequently he was engaged on research both at Manchester and Heidelberg, and was awarded the degree of D.Sc. (Manc.) in 1904. He was for six years chemist with Messrs. Levinstein, Ltd., and then became Manager and Chief Chemist to Messrs. Brooke, Simpson & Spiller, Ltd., at Hackney Wick. He was later Chief Chemist at the Dalton Works of British Dyes, Ltd., which position he resigned in June, 1917. He was Editor of the Journal of the Chemical Society from 1906 until his death, author of numerous papers on technical research, joint author of "Synthetic Dyestuffs," and author of "The Chemistry and Technology of the Diazo-Compounds" and of "The Manufacture of Intermediate Products for Dyes."

He was elected a Fellow of the Institute in 1918.

WILLIAM ARTHUR HAWARD died on 6th December from injuries received through an explosion at the Imperial College of Science and Technology. Born at Islington in 1894 and educated at Owen's School, he passed the Intermediate Science Examination of London University before entering the Imperial College of Science and Technology, where he took the Diploma of A.R.C.S., in the First Class in Chemistry, also graduating as B.Sc. (Lond.) with First Class Honours, and gaining the Diploma of the Imperial College, for advanced study and research in Chemical Technology, and later M.Sc. (Lond.). During 1914-1916 he was engaged, with Prof. Bone and Dr. R. V. Wheeler, on research of national importance, on the results of which he was awarded a Beit Fellowship, but in 1917 he proceeded to an appointment at H.M. Factory, Gretna, for work under the Ministry of Munitions. Subsequently he returned to Imperial College, where he held a Salters' Fellowship, and had been engaged for two years on investigations into the behaviour of gases under pressure when the explosion occurred which caused his death. He was elected an Associate of the Institute in 1918.

GEORGE LEWIN died in the summer of 1920 while on a holiday at Bournemouth in his 81st year. He entered the Inland Revenue Department in 1861, and three years later was selected to undergo a course of training under Hofmann at the College of Chemistry preparatory to his joining the staff of the Inland Revenue Laboratory at Somerset House, and in the course of time became a Superintending Analyst in the Government Laboratory. His work was mainly connected with the chemistry of foods and drugs; he was largely responsible for official analysis of samples taken under the Sale of Food and Drugs Acts,

and his investigations formed the basis of Dr. James Bell's handbook on the subject. He is credited especially with the discovery of the mode in which the glycerides of butter are arranged. After his retirement in 1902 he conducted a private practice as a food analyst and consulting chemist. He was elected a Fellow of the Institute in 1878, and served as a member of Council for two periods.

JULIUS OSTERSETZER died in Dublin on November 26th, 1920, in his 71st year. He was trained at the Imperial Polytechnic Institute of Vienna from 1866 to 1870, and after holding the position of chemist to Messrs. Newton Keates & Co., Copper Works, St. Helens, became chief chemist and manager to Messrs. W. and H. M. Goulding, Fertiliser Manufacturers, of North Wall, Dublin, with whom he had been associated for fifty years. He was a Member of the Royal Dublin Society and well-known in local scientific circles. He was elected a Fellow of the Institute in 1888.

PERCIVAL SPENCER UMFREVILLE PICKERING died in his 63rd year. The son of Percival A. Pickering, Q.C., he was educated at Eton and at Balliol College, Oxford, and in 1880 obtained a first-class in the Honours School of Natural Science. From 1881 to 1887 he held a lectureship at Bedford College, and, having fitted up a private laboratory in Bryanston Square, devoted himself to independent research, mainly in physical chemistry. Owing to an accident in the laboratory from which he lost the sight of one eye and suffered in health, he directed his attention to agricultural chemistry, and began, in 1894, investigations on the cultivation of fruit trees which he carried out at one of the experimental farms of the Duke of Bedford at Woburn, and continued until the time of his death, the work being financed until 1918 by the Duke, and since then by the Rothamsted Committee. He was elected a Fellow of the Royal Society in 1890, and served three times on the Council of the Chemical Society. He was elected a Fellow of the Institute in 1887.

JOHN SHIELDS, who died recently in his 52nd year, was born at Bathgate, West Lothian, and educated at Bathgate Academy and Stewart's College, Edinburgh. He graduated in physical experimental sciences at Edinburgh University in 1889, and proceeded to Strassburg, where he took the degree of Ph.D., in 1890. After further study at Leipzig and Stockholm, he engaged in research at University College, London, and at Edinburgh, as the result of which he was awarded the D.Sc. in Chemistry. He continued research at University College from 1893 to 1897, and then for a year at the Davy Faraday Laboratory, except for a few months in 1896, while he was engaged on the caustic plant of Messrs. Brunner Mond & Co. at Northwich. In 1896-97 he was Lecturer in General and Physical Chemistry in the Royal College of Science, London, and acted as an Assistant Examiner under the Science and Art Department and as an Examiner in the University of Aberdeen. In 1898 he worked for several months on technical research with Dr. Ludwig Mond, and in 1899 became resident consulting chemist to the Scottish Cyanide Co. at Leven. He was the author of numerous papers published in English and Foreign Scientific Journals. He was elected a Fellow of the Institute in 1899.

CHARLES SIMMONDS, O.B.E., died suddenly from heart failure in London on the 15th January in his 60th year. Born at Stourbridge, he received his scientific training at the Royal College of Science, London, and in the Government Laboratory, which was then at Somerset House, and subsequently by evening work at Finsbury Technical College and at Birkbeck College, graduated as B.Sc. (Lond.). He entered the Government Laboratory in 1887, and at the time of his death was a Superintending Analyst. He did important work, during official inquiries, on lead-poisoning in the pottery industry, on the analysis of sour milks, and in connection with the last revision of the British Pharmacopœia. His investigations into the composition of pottery glazes and fritts, conducted for the Royal Commission on that subject, are well known, and were incorporated in an article in Thorpe's Dictionary of Applied Chemistry, and contributed from time to time in papers published in the Transactions of the Chemical Society and The Analyst. He was also the author of a standard work recently published on "Alcohol: its production, properties, and technical applications." He was elected a Fellow of the Institute in 1919.

SAMUEL ARCHIBALD VASEY died at Bromley, Kent, on January 7th, 1921, in his 55th year. Educated at the City of London School, he received his training in chemistry mainly at Charing Cross Hospital Medical School, under Prof. C. W. Heaton, to whom he subsequently became chief assistant in the Lancet Laboratory, acting at the same time as Demonstrator in the School. On the death of Prof. Heaton in 1893, he was appointed Director of the laboratory of The Lancet, which position he held until his death. His investigations, which have been recorded in that Journal during the past twenty-eight years, though mainly relating to the foodstuffs, hygiene and public health, covered a very wide field of enquiry into the chemistry of everyday life. He was elected an Associate in 1888 and a Fellow in 1891.

January Examinations.

Examinations were held at the Institute during the week commencing January 10th, 1921, in General Chemistry and in Mineral Chemistry, for the Associateship; and in the Chemistry (including Microscopy) of Food and Drugs, Fertilizers, Feeding Stuffs, Soils and Water, for the Fellowship; also at the Royal Technical College, Glasgow, in the Chemical Technology of Coal-tar and Ammonia, for the Associateship.

One candidate presented himself in each branch.

The following candidates satisfied the Board :—

For the Associateship.

Chapman, Cecil (Chemical Technology).

McClure, Keith Alister Johnstone, B.A. (Cantab.) (General Chemistry).

The Examination Papers were as follows :

General Chemistry. 10th to 14th January, 1921.

MONDAY, JANUARY 10th : 10 a.m. to 1 p.m.

The Candidate was required to answer two papers in General Theoretical Chemistry.

TUESDAY and WEDNESDAY, JANUARY 11th and 12th : 10 a.m. to 4.30 p.m.

1. A is a sample of commercial sodium sulphide. Estimate the following constituents in it :—

- (1) Insoluble matter dried at 100°.
- (2) Water-soluble sulphide.
- (3) Water-soluble thiosulphate.
- (4) Water-soluble carbonate.

The last three constituents are to be calculated as percentages of Na_2S , $\text{Na}_2\text{S}_2\text{O}_3$, and Na_2CO_3 respectively, on the original crude sulphide.

2. Write a short report on the nature of the insoluble matter, based on qualitative examination only.

In writing up your results indicate clearly the precautions you adopt to ensure that no change in the composition takes place during the analytical operations.

If necessary this exercise may be completed on Thursday.

THURSDAY and FRIDAY, JANUARY 13th and 14th : 10 a.m. to 4.30 p.m.

1. B is a sample of succinic acid. Prepare from this :—

- (1) A sample of ethyl succinate.
- (2) A sample of succinimide.
- (3) A sample of succinamic acid.
- (4) A sample of succinamide.

2. Determine the melting points of your products where they are solid at the ordinary temperature and their boiling points where practicable.

State the quantities taken and the yield of products obtained.

Branch (a)—Mineral Chemistry, 10th to 14th January, 1921.

MONDAY, JANUARY 10th : 10 a.m. to 1 p.m.

1. State how you would prepare a sample of sulphuretted hydrogen in a state of purity suitable for physico-chemical determinations. How can the nature and amounts of unavoidable impurity be determined ?

2. State the minerals from which antimony is commonly obtained. Give an account of the usual methods of extracting this metal from its ores, and mention the impurities commonly present in the commercial product. Indicate how these impurities can be qualitatively proved, and give a short account of the uses of antimony and its salts.

3. Two samples of vulcanised rubber are submitted to you for analysis. In the process of manufacture one of these has had mixed with it zinc sulphide and mercury sulphide ; the other has been mixed with zinc oxide and graphite. Draw up a scheme for the determination of the proportion of zinc and graphite in the one case, and zinc and mercury in the other.

4. Sketch and describe any apparatus in use for the fractional distillation of liquid air on the large scale. Mention the products obtained and indicate in each case the industrial applications, the nature and amounts of the impurities, and the influence of these impurities on the value of the gases for the uses given.

5. Write a short essay on one of the following :—

- (a) The criteria of purity of a chemical substance.
- (b) Double salts.
- (c) The theory of indicators.

TUESDAY and WEDNESDAY, JANUARY 11th and 12th : 10 a.m. to 4.30 p.m.

Make a complete mineral analysis of the water A, and report on its suitability for use in a steam boiler fitted with an economiser.

Prepare a specimen of any pure titanium salt from rutile.

THURSDAY and FRIDAY, JANUARY 13th and 14th : 10 a.m. to 4.30 p.m.

Make a complete analysis of the antimonial lead B. Examine for traces of bismuth, copper and arsenic.

Determine the impurities in the liquid carbon dioxide supplied.

Branch (e)—The Chemistry (and Microscopy) of Foods and Drugs, etc. 10th to 14th January, 1921.

MONDAY, JANUARY 10th : 10 a.m. to 1 p.m.

1. Describe in detail a method for the determination or estimation of "ethers" (esters) in potable spirit, showing how you would express the results.

2. Discuss very briefly the bearing of modern investigations on factors that may influence the comparative effects of different fatty foods on the well-being of the consumer.

3. Describe a scheme for the treatment of the sewage of a small town the effluent of which has to be turned into a river whose water lower down may be used for potable purposes. What criteria of "purification" might reasonably be demanded of such an effluent?

Answer in a separate notebook.

1. Enumerate the official preparations of cinchona bark, giving in each case the composition and dose. State how you would determine the percentage of quinine, and of total alkaloids in a sample of bark.

2. Give an account of the symptoms produced in chronic lead poisoning, and state the circumstances under which it commonly occurs. Mention the preparations meant for external application, which contain lead as a constituent.

3. Describe the optical parts of a good achromatic microscope, and illustrate the practical utility of the polariscope in microscopic work.

MONDAY, JANUARY 10th : 2 p.m. to 5 p.m.

1. The sample of limejuice provided contains lead; determine its amount.

2. Identify the foreign starch contained in the sample of wheaten flour, and from the microscopical appearance attempt a rough estimate of the amount present. (Potato.)

3. Identify the preparations on the slides provided. (Human muscle fibre; cotton fibre; silk; jute.)

TUESDAY, JANUARY 11th : 10 a.m. to 4.30 p.m.

The wine given to you contains a preservative. Identify it and ascertain approximately its proportion. (Benzoic acid.)

Determine the caffeine in the sample of tea. (This latter exercise may be completed to-morrow.)

WEDNESDAY, JANUARY 12th : 10 a.m. to 4.30 p.m.

Complete the tea analysis begun yesterday.

Examine the given sample of oil as far as you can in one day's work. It was sold as "Salad Oil." Draw up in proper form a certificate relating to it.

THURSDAY, JANUARY 13th : 10 a.m. to 4.30 p.m.

The fluid supplied is a sweetened solution of Potassium Iodide and Potassium Bromide. Determine the quantities of each of these salts expressed as grains per fluid ounce of solution.

FRIDAY, JANUARY 14th : 10 a.m. to 4.30 p.m.

Determine the oil and "albuminoids" in the sample of "maize germ meal."

Report briefly on the three samples of drinking water represented by the results of chemical analysis and bacteriological examination shown to you.

Candidates were required to translate the following passages from French and German :—

Translate into English.

Dans un certain nombre de circonstances, on peut se proposer, soit d'opérer les combustions, soit d'en mesurer les produits, à une température différente de la température ambiante. En particulier, on peut déterminer à l'état gazeux le volume de la vapeur d'eau formée dans une combustion.

A cet effet, on opère dans un eudiomètre, à parois suffisamment minces, entouré d'un cylindre ou cercle : soit de l'eau à une température déterminée (à l'aide d'un thermomètre) ; soit un courant de vapeur d'eau, ou d'un autre corps, maintenue en ébullition à une température donnée, telle que celle de son ébullition sous la pression atmosphérique. La vapeur d'eau, est la plus commode à employer à cet effet, à la température de 100°, sans appareils spéciaux et compliqués, et en raison de sa noninflammabilité. La figure 54 (p. 121) indique des dispositions faciles à réaliser.

Traité Pratique de l'Analyse des Gaz.—

M. BERTHELOT.

Translate into English.

Die Halogene (Chlor, Brom und Jod) werden nur in wenigen Fällen aus organischen Verbindungen durch Kochen mit Silbernitrat als Halogensilber abgeschieden. Um sie sicher nachzuweisen, zerstört man durch Glühen mit chemisch reinem Kalk die organische Substanz vollständig ; das Halogen bleibt dann an Calcium gebunden zurück und kann nach dem Lösen der geglühten Masse in Salpetersäure durch Fällung mit Silbernitrat erkannt werden. Stickstoff freie Substanzen kann man auch durch Erhitzen mit Natrium, Lösen der Schmelze in Salpetersäure und Fällern mit Silbernitrat auf Halogene prüfen, während dies bei stickstoffhaltigen Substanzen wegen der Bildung von Cyansilber nicht angeht.

MEYER-JACOBSON.

Branch (g)—Chemical Technology of Coal Tar and Ammonia.
10th to 14th January, 1921.

MONDAY, JANUARY 10th : 10 a.m. to 1 p.m.

General Chemical Technology.

(Four questions to be answered.)

1. Discuss the action of sulphuric acid on lead, referring to the influence of (a) temperature, (b) concentration, and (c) impurities in the metal. Describe the construction of a lead tank, with a run-off cock, for storing oil of vitriol.

2. Write an account of the properties of fused silica, and state the uses to which it is put in chemical industry.

3. Specify the materials you would use for the construction of the following : (a) floor of an acid store, (b) tank for storing commercial hydrochloric acid solutions in bulk, (c) vessel for the concentration of sulphuric acid to 98%, (d) still for distillation of acetic acid, (e) vessel for evaporation of an aqueous solution of citric acid. Sketch (b) and describe the method of construction.

4. Describe the determination of the calorific value of a sample of coal by the bomb calorimeter, explaining the necessary corrections.

5. Discuss the effect of varying the proportion of steam to air in gas production on (a) the working of the producer, (b) the temperature of the coke, (c) the composition of the gas, (d) the suitability of the gas for the generation of heat and power. State the composition of an average producer gas.

6. You are required to report on the efficiency of combustion of coal under a boiler ; give a general statement of your method of procedure and specify the conditions which you would consider satisfactory.

2 p.m. to 5 p.m.

(Four questions to be answered.)

1. You are required to report on a sample of lubricating oil ; state the tests you would apply ; explain the purpose of each and describe in detail the test you consider to be the most important.

2. Sketch and describe (a) a centrifugal pump for ammoniacal liquor, and (b) either a 4-blade exhaustor, or a Root's blower.

3. Describe and discuss the methods used industrially for the removal of tar-fog and fine dust from gases.

4. State the various methods employed in industry for the separation of solids from liquids. Sketch (a) a chamber filter press, (b) a frame press, and discuss the advantages of each.

5. How is the rate of heat transmission through metals to a boiling liquid affected by (a) temperature difference, (b) nature of the metal and of its surface, (c) nature of the liquid, and (d) rate of movement of the steam over the heating surface ? Sketch and describe the operation of the Kestner film evaporator.

6. Discuss the separation of two or more liquids by fractional distillation, referring to the influence of (a) the nature of the liquids, (b) the form and size of the still-head, and (c) the rate of distillation. Sketch a benzol still and illustrate the different forms of still-head used industrially.

TUESDAY, JANUARY 11th : 10 a.m. to 1 p.m.
(*Four questions to be answered.*)

1. State what you know of the characteristics of the following tars: (a) horizontal retort, (b) vertical retort, (c) water gas, (d) blast furnace, (e) coke oven, (f) low temperature carbonisation.

2. Sketch two types of tar still with connections, and state the advantages and disadvantages of both designs.

3. Give the specifications for Nos. 1, 2 and 3 Road Board tars, and discuss the influence of the factors specified on the value of the tar for road work.

4. Describe and illustrate by sketches a causticising plant. State how you would deal with the sludge, and describe the tests applied to check the working of the plant.

5. What would you regard as a suitable oil for washing gas for benzol recovery? Give Colman's specification for wash oil. Under what conditions (a) as to temperature, (b) as to scrubber capacity, (c) as to distribution and quantity of wash oil, (d) as to impurities in wash oil, may benzol recovery be best carried out? How would you eliminate naphthalene in the process of recovering benzol?

6. Describe Pepper's patent extracting plant; discuss fully the reasons for its present position in technical practice.

2 p.m. to 5 p.m.
(*Four questions to be answered.*)

1. Describe the extraction of anthracene from tar, and its estimation in crude anthracene. Describe the estimation of paraffin in anthracene.

2. If a pure ammonia solution plant "went foul," describe what methods you would adopt to bring the plant back to normal working again.

3. Describe two methods of "springing" tar acids from their soda compounds, and state their advantages or otherwise.

4. Sketch and describe two forms of dephlegmator. What are the functions of a dephlegmator, and under what circumstances might it be dispensed with?

5. State what you know of the recovery of pyridine from coal tar, and of its commercial and scientific uses.

6. State the principal industrial uses of carbofic and cresylic acids, and compare and contrast their properties, referring to (1) melting point, (2) boiling point, (3) solubility in (a) water, (b) 0.880 ammonia, (c) caustic soda of different strengths, (d) petroleum spirit, (e) aqueous glycerine.

WEDNESDAY, JANUARY 12th : 10 a.m. to 4.30 p.m.

Examine the sample of crude benzol supplied and report the percentages of benzene and toluene.

THURSDAY, JANUARY 13th : 10 a.m. to 4.30 p.m.

Determine the calorific value of the sample of oil supplied, and estimate the percentage of sulphur.

The candidate was required to translate the following passages from French and German :—

Translate into English.

Il devrait suffire, du reste, de rappeler les découvertes de la thermochimie sur la chaleur de formation des corps, dont les uns dégagent de la chaleur pendant leur formation, tandis que d'autres en absorbent. La loi de Dulong ne tient aucun compte de ces faits, ni de la chaleur de combinaison de l'hydrogène avec le carbone, dans les hydrocarbures : elle applique au carbone un coefficient choisi arbitrairement parmi ceux qui nous sont connus aujourd'hui, alors qu'il y a une différence de près de 300 calories sur 8000, suivant qu'on fait usage de celui du carbone diamant ou du carbone de bois. Dans la comparaison qu'ils ont faite entre la chaleur de combustion de la cellulose et le résultat du calcul, MM. Berthelot et Vieille ont adopté le coefficient du diamant ; or, en remplaçant dans la formule de Dulong, le coefficient 8080 par celui du diamant 7859, les écarts entre le calcul et l'expérience augmentent encore.

SCHEURER-KESTNER.

Translate into English.

Eine gewisse, aber unbedingt nicht ausreichende Entschuldigung für diese merkwürdige Fahrlässigkeit so vieler ausübender Chemiker ist der Umstand, dass die Kalibrirung, bezw. Korrektion eines Satzes von gläsernen Messgefässen, eine viel langwierigere Arbeit als die Kontrolle einer Wage und eines Gewichtsatzes ist, und dass die erstere Operation gerade genaue Wagen und Gewichte verschiedener Arten voraussetzt, die in manchen technischen Laboratorien, welche sie sonst nicht nöthig haben, gar nicht vorhanden sein mögen. Aber diese Arbeit darf eben nicht geschaut werden, wenigstens für den Theil der Instrumente, welche zu Analysen für den äusseren Verkehr dienen, während die für die Betriebskontrolle, namentlich in den Händen von Empirikern, dienenden Apparate allerdings meist keine solche Garantie der Genauigkeit beanspruchen, und man hier billige Apparate anwenden kann, die man immerhin einer gewissen Kontrolle unterwerfen sollte, wenn auch keiner eigentlichen Kalibrirung.

LUNGE.

Books and their Contents.

[Books marked * have been presented by the authors or publishers, and may be seen in the Library of the Institute.]

- “ Application of Dyestuffs to Textile, Paper, Leather and other Materials.” J. M. Matthews. Pp. xvi. and 768. (New York : John Wiley & Son, Inc. ; London : Chapman & Hall, Ltd.) 57s. 6d.

Chemical study of the fibres ; scouring ; bleaching ; classification of dyes : application of acid dyes to wool, silk, cotton, etc. ; stripping of colours ; application of basic dyes to cotton ; application of substantive dyes to cotton, wool and silk ; developed dyes on cotton and silk ; application of mordant dyes ; sulphur dyes ; vat dyes ; aniline black ; logwood and the minor natural dyes ; mineral dyes ; dyeing of fabrics containing mixed fibres ; theory of dyeing ; application of dyes to various materials ; testing of dyestuffs ; data.

- “ Benzol.” S. E. Whitehead. Pp. xx. and 209. (London Benn Bros. Ltd.) 12s. 6d.

Part I. : Recovery of benzol from gas.

Part II. : Rectification of benzol.

Part III. : Uses of benzol and its products.

- “ Chemical Theory, The Foundations of.” R. M. Caven. Pp. 274. (London : Blackie & Son, Ltd.) 12s. 6d.

- “ Chemistry of Plant Products, An Introduction to the.” P. Haas and T. G. Hill. Vol. I. Pp. xiii. and 414. (London : Longmans, Green & Co.) 16s. net.

In ten sections referring respectively to fats, oils and waxes ; aldehydes, carbo-hydrates, glucosides, tannins, pigments, nitrogen bases, the colloidal state, proteins, enzymes.

“Dictionary of Applied Chemistry.” Sir Edward Thorpe.
Vol. I. : A to Calcium. Pp. x. and 752. New Edition.
(London : Longmans, Green & Co.) 6os.

“Dye Chemistry.” Fierz David, translated by F. A. Mason.
Pp. xiv. and 240. (London : J. & A. Churchill.) 21s.

I., Intermediate products : (1) sulphonations ; (2) nitrations and reductions ; (3) chlorinations ; (4) oxidations ; (5) condensations.

II., Dyes : (6) azo-dyes ; (7) triphenylmethane dyes ; (8) sulphur melts ; (9) miscellaneous ; (10) summary.

III., Technical details : (11) vacuum distillation ; (12) autoclaves ; (13) structural materials ; (14) works management ; (15) costing.

IV. : (16) analytical details.

“Inorganic Chemistry, A Text-Book of.” J. R. Partington.
Pp. xii. and 1062. (London : Macmillan & Co., Ltd.) 25s.

Pure substances and mixtures ; elements, compounds, and solutions ; the composition of the air and the theory of combustion ; physical properties of gases and vapours ; solutions and the phase rule ; laws of stoichiometry ; atomic theory ; Avogadro's hypothesis and the molecule ; hydrogen ; chlorine ; valency ; electrolysis ; molecular weights of substances in solution ; ozone and hydrogen peroxide ; law of mass-action ; halogens ; atomic heats and isomorphism ; classification of the elements and the periodic law ; sulphur ; selenium and tellurium ; nitrogen ; inactive elements ; phosphorus ; arsenic ; carbon and the hydrocarbons ; boron and silicon ; spectrum analysis ; metals and alloys ; metals of the alkalies ; alkaline earth-metals ; metals of the zinc group ; metals of group III. of the periodic system ; metals of the fourth group ; metals of the nitrogen group ; metals of the sulphur group ; manganese, iron, cobalt, nickel and the platinum metals ; radio-elements and the structure of the atom.

“Lubricating and Allied Oils.” E. A. Evans. Pp. xiv. and 128. (London : Chapman & Hall, Ltd.) 9s. 6d.

Handbook for chemists, engineers and students.

“Lubrication, the Practice of.” T. C. Thomsen. Pp. xi. and 607. (New York : McGraw Hill Book Co., Inc.) 36s.

An engineering treatise on the origin, nature and testing of lubricants their selection, application and use.

“Metallic Alloys.” G. H. Gulliver. Fourth Edition, with Appendix. Pp. xxviii. and 439. (London: Charles Griffin & Co., Ltd.) 15s.

Methods of investigation; physico-chemical equilibrium of mixed substances; binary laws in which no definite chemical compounds are formed; those in which evidence of such formation is shown; transformations which take place in completely solid metals and alloys; equilibrium conditions in metallic mixtures; structure of metals and alloys; metals and copper; alloys of iron; alloys of more than two metals; appendix.

“Metallurgy, Handbook of.” Carl Schnabel, translated by Henry Louis. Third Edition. Vol. I. Pp. xxi. and 1171. (London: Macmillan & Co., Ltd.) 40s.

Metallurgy of copper, lead, silver, gold.

“Microscope, The, its Design, Structure and Applications.” A symposium and general discussion held by the Faraday Society, the Royal Microscopical Society, the Optical Society, the Photo-Micrographic Society, in collaboration with the Technical Optics Committee of the British Science Guild. Edited by F. S. Spiers. (London: Charles Griffin & Co., Ltd.) Pp. 260. 21s.

“Modern Coking Practice, including the Analysis of Materials and Products.” J. E. Christopher and T. H. Byrom. Third Edition, in two Volumes. 10s. 6d. each Volume.

Vol. I.: Raw Materials and Coke. Pp. xxi. and 130.

Vol. II.: By-Products. Pp. xxii. and 130.

“Nucleic Acids, their Chemical Properties and Physiological Conduct.” Walter Jones. Pp. viii. and 150. (London: Longmans, Green & Co.) 9s. net.

The chemical properties of nucleic acids; physiological conduct of nucleic acids.

*“Organic Medicinal Chemicals.” M. Barrowcliff and F. H. Carr. Pp. vii. and 331. (London: Bailliere, Tindall & Cox.) 15s.

Narcotics and general anæsthetics; naturally occurring alkaloids; natural and synthetic local anæsthetics; anti-pyretics and analgesis; organic antiseptics and disinfectants; purgatives; vaso constrictors and vaso dilators; diuretics and uric acid solvents; organo-metallic compounds; the digitalis group. etc.

“ Practical Chemistry, Text-Book of.” G. F. Hood and J. A. Carpenter. (London : J. & A. Churchill.) Pp. xii. and 527. 21s. net.

Inorganic preparations ; inorganic qualitative and quantitative analysis ; organic preparations ; organic analysis ; physical chemistry.

“ Qualitative Analysis.” Fresenius. 17th Edition, translated by C. A. Mitchell. Pp. xix. and 942. (London : J. & A. Churchill.) 36s. net.

“ Rubber, Resins, Paints and Varnishes.” R. S. Morrell and A. de Waele. Pp. 247. (Bailliere, Tindall & Cox.) 12s. 6d.

*“ Technical Chemist’s Pocket Book, containing a Collection of Notes, Tables, and Data useful to Technical Chemists, Metallurgists and Chemical Engineers.” Robert Ensoll. Pp. viii. and 196. (London : E. & F. N. Spon, Ltd.) 8s. 6d.

Changes in the Register.

At the meetings of the Council held on 17th December, 1920, and 21st January, 1921, one Fellow was re-elected, 4 Associates were elected to the Fellowship, and 51 new Associates were elected, and 71 students were admitted.

The Institute has lost 7 Fellows and 1 Associate by death.

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New Fellow.

Francis, William, Science and Agriculture Department, Georgetown, Demarara.

Associates Elected to Fellowship.

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Hall, Archibald John, B.Sc. (Lond.), c/o Silver Springs Bleaching and Dyeing Co., Timbersbrook, Congleton, Cheshire.

Hall, Horace Campbell, 7, Dairy House Road, Derby.

Raistrick, Harold, D.Sc. (Leeds), B.A. (Cantab.), Messrs. Nobel's Explosives Co., Ardeer Factory, Stevenston, Ayrshire.

New Associates (by Examination).

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McClure, Keith Alistair Johnstone, B.A. (Cantab.), Experimental Station, Porton, Salisbury.

New Associates.

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OF
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JOURNAL AND PROCEEDINGS.
1921.

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ALEXANDER FINDLAY, M.A., D.Sc., Ph.D. : (ABERDEEN).
GEORGE WATSON GRAY : (LIVERPOOL).
FRANK WILLIAM HARBORD, C.B.E., A.R.S.M. : (LONDON).
CHARLES ALEXANDER HILL, B.Sc. : (LONDON).
PATRICK HENRY KIRKALDY : (LONDON).
FREDERIC HERBERT LEES : (LONDON).
SAMUEL ERNEST MELLING : (MANCHESTER).
GORDON WICKHAM MONIER-WILLIAMS, O.B.E., M.C., Ph.D. :
HAROLD MOORE, O.B.E., B.Sc. : (LONDON). (LONDON).
ANDREW MORE, A.R.C.S. : (LONDON).
FREDERICK MOLLWO PERKIN, Ph.D. : (LONDON).
BENJAMIN DAWSON PORRITT, M.Sc. : (LONDON).
THOMAS SLATER PRICE, O.B.E., D.Sc., Ph.D. : (LONDON).
WILLIAM RINTOUL, O.B.E. : (AYRSHIRE).
WILLIAM HENRY ROBERTS, M.Sc. : (LIVERPOOL).
ERNEST WOODHOUSE SMITH, D.Sc. : (LONDON).
LEONARD ELLERTON VRIES : (MANCHESTER).
SIR JAMES WALKER, D.Sc., F.R.S. : (EDINBURGH).

CENSORS, 1921-1922 :

THE PRESIDENT, *ex-officio*.SIR JAMES JOHNSTON DOBBIE, LL.D., D.Sc., F.R.S., *Past-President*.

BERNARD DYER, D.Sc.,

SIR HERBERT JACKSON, K.B.E., F.R.S., *Past-President*.

SIR ROBERT ROBERTSON, K.B.E., F.R.S.

DATES OF COUNCIL MEETINGS.

1921 : APRIL 22ND.

MAY 27TH.

JUNE 24TH.

JULY 22ND.

OCTOBER 28TH.

1921 : NOVEMBER 25TH.

DECEMBER 16TH.

1922 : JANUARY 20TH.

JANUARY 27TH.

FEBRUARY 24TH.

ANNUAL GENERAL MEETING : MARCH 1st, 1922.

Committees for 1921-22.

CHAIRMAN.*

FINANCE AND HOUSE COMMITTEE:

THE PRESIDENT, WITH H. BALLANTYNE, L. EYNON, E. M. HAWKINS, PATRICK H. KIRKALDY, F. H. LEES, WM. MACNAB, G. W. MONIER-WILLIAMS, GEORGE STUBBS, AND E. W. VOELCKER*.

GENERAL PURPOSES COMMITTEE:

THE COUNCIL IN COMMITTEE. THE PRESIDENT*.

LEGAL AND PARLIAMENTARY COMMITTEE:

THE PRESIDENT, WITH H. BALLANTYNE*, A. J. CHAPMAN, A. COTTRELL, E. M. HAWKINS, C. A. HILL, SIR HERBERT JACKSON, WM. MACNAB, S. E. MELLING, G. T. MORGAN, W. RINTOUL, GEORGE STUBBS, AND E. W. VOELCKER.

NOMINATIONS, EXAMINATIONS, AND INSTITUTIONS COMMITTEE:

THE COUNCIL IN COMMITTEE. THE PRESIDENT*.

PUBLICATIONS COMMITTEE:

THE PRESIDENT, WITH W. BACON, H. BALLANTYNE*, A. COTTRELL, A. C. CUMMING, F. G. DONNAN, L. EYNON, G. WATSON GRAY, PATRICK H. KIRKALDY, S. E. MELLING, G. W. MONIER-WILLIAMS, H. MOORE, A. MORE, F. MOLLWO PERKIN, T. SLATER PRICE, AND GEORGE STUBBS.

SPECIAL COMMITTEES.

BENEVOLENT FUND COMMITTEE:

THE PRESIDENT, WITH H. BALLANTYNE, O. L. BRADY, E. M. HAWKINS, H. L. HEATHCOTE, OTTO HEHNER, SIR HERBERT JACKSON, PATRICK H. KIRKALDY, F. H. LEES, H. MOORE, A. MORE, C. PROCTOR, AND E. W. VOELCKER.*

LECTURES AND LIBRARY COMMITTEE:

THE PRESIDENT, WITH F. H. CARR, C. H. CRIBB, SIR JAMES J. DOBBIE, F. G. DONNAN, BERNARD DYER, A. FINDLAY*, A. J. HALE, A. HARDEN, OTTO HEHNER, C. A. HILL, SIR HERBERT JACKSON, C. A. KEANE, PATRICK H. KIRKALDY, F. H. LEES, H. R. LE SUEUR, F. J. LLOYD, GEORGE MCGOWAN, G. T. MORGAN, F. MOLLWO PERKIN, F. M. POTTER, T. SLATER PRICE, W. RINTOUL, GEORGE STUBBS, J. MILLAR THOMSON, AND THE EXAMINERS.

PUBLIC APPOINTMENTS COMMITTEE:

THE PRESIDENT*, WITH E. J. BEVAN, E. R. BOLTON, O. L. BRADY, C. H. CRIBB, J. T. DUNN, BERNARD DYER, L. EYNON, G. WATSON GRAY, E. M. HAWKINS, OTTO HEHNER, C. A. HILL, F. J. LLOYD, S. E. MELLING, A. MORE, G. H. PERRY, P. A. ELLIS RICHARDS, W. H. ROBERTS, SIR ROBERT ROBERTSON, H. SILVESTER, A. SMETHAM, GEORGE STUBBS, T. TICKLE, E. W. VOELCKER, J. A. VOELCKER, W. M. GATHORNE YOUNG, A REPRESENTATIVE OF THE IRISH ANALYSTS' ASSOCIATION, AND ONE OF THE ASSOCIATION OF PUBLIC ANALYSTS FOR SCOTLAND.

SERVICES COMMITTEE:

ANY MATTER ARISING IN CONNECTION WITH THE SERVICES COMMITTEE (1920-1921) WILL BE REFERRED TO THE GENERAL PURPOSES COMMITTEE.

SPECIAL COMMITTEE *Re* HONORARY CORRESPONDING SECRETARIES

THE PRESIDENT*, WITH O. L. BRADY, J. C. BURNHAM, F. G. DONNAN, C. S. GIBSON, A. LIVERSIDGE, WM. MACNAB, D. NORTHALL-LAURIE, E. W. VOELCKER, AND W. M. GATHORNE YOUNG.

SPECIAL COMMITTEES—(continued).**SPECIAL PURPOSES COMMITTEE:**

(CHEMICAL REAGENTS, RESEARCH CHEMICALS, LABORATORY GLASS AND PORCELAIN, &c.)

THE PRESIDENT*, WITH H. BALLANTYNE, E. R. BOLTON, O. L. BRADY, W. T. BURGESS, F. H. CARR, A. W. CROSSLEY, F. G. DONNAN, J. T. DUNN, BERNARD DYER, J. J. FOX, E. M. HAWKINS, OTTO HEHNER, C. A. HILL, W. R. E. HODGKINSON, SIR HERBERT JACKSON, P. H. KIRKALDY, A. LAPWORTH, F. H. LEES, T. M. LOWRY, WM. MACNAB, G. T. MORGAN, D. NORTHALL-LAURIE, F. M. POTTER, P. A. ELLIS RICHARDS, SIR ROBERT ROBERTSON, S. SMILES, H. L. SMITH, J. F. THORPE, C. K. TINKLER, MORRIS W. TRAVERS, L. E. VLIES, E. W. VOELCKER, AND SIR JAMES WALKER.

LOCAL SECTION COMMITTEES:**BIRMINGHAM AND MIDLAND:**

E. W. SMITH (CHAIRMAN), N. P. BOOTH, S. R. CARTER, GEORGE KING, F. R. O'SHAUGHNESSY, H. SILVESTER, G. B. STONES, D. F. TWISS AND L. P. WILSON. HON. SEC.: F. C. A. H. LANTSBERRY, 63, WALFORD ROAD, SPARKBROOK, BIRMINGHAM.

EDINBURGH AND EAST OF SCOTLAND:

L. DOBBIN (CHAIRMAN), A. LAUDER (VICE-CHAIRMAN), E. ANDERSON, J. G. ANNAN, R. BRUCE, M.C., A. DARGIE, T. W. DRINKWATER, R. H. FINDLATER, S. J. G. C. MACADAM, J. W. ROMANES, S. STEWART, J. F. TOCHER, J. A. WATSON AND W. A. WILLIAMS. HON. SEC. AND TREASURER: B. D. W. LUFF, 85, ASHLEY TERRACE, EDINBURGH.

GLASGOW AND WEST OF SCOTLAND:

JAMES MACLEOD (CHAIRMAN), THOMAS COCKBURN (ASSISTANT SECRETARY), C. H. DESCH, F. W. HARRIS, G. G. HENDERSON, A. J. ROBERTSON, W. W. LUMSDEN, J. SORLEY, R. T. THOMSON AND J. M. WEIR. HON. SEC. AND TREASURER: T. A. WILSON, 91, NEW ROAD, AYR.

GRETNA AND DISTRICT:

J. C. BURNHAM (CHAIRMAN), T. H. GANT, J. S. HILL, H. R. NEECH AND F. WILLIAMS. HON. SEC.: WILLIAM CAW, H.M. FACTORY, GRETNA, EASTRIGGS, DUMFRIESSHIRE.

IRELAND:

W. E. ADENEY (CHAIRMAN), R. F. BLAKE, B. J. FAGAN, J. H. MILLAR, HUGH RYAN, SYDNEY YOUNG (TREASURER). HON. SEC.: A. G. G. LEONARD, 18, BELGRAVE ROAD, RATHMINES, DUBLIN.

LOCAL SECTION COMMITTEES—(continued).**LIVERPOOL AND NORTH WESTERN COUNTIES:**

W. H. ROBERTS (CHAIRMAN), C. D. BANNISTER, F. J. BRISLEE, H. J. EVANS, F. S. FOWWEATHER, G. WATSON GRAY, JOHN HANLEY, I. M. HEILBRON, E. GABRIEL JONES, WILLIAM RAMSAY, ALFRED SMETHAM, F. J. SMITH, H. B. STOCKS, GEORGE TATE, AND W. COLLINGWOOD WILLIAMS. HON. SEC. AND TREASURER: JOHN HANLEY, 7 UNIVERSITY ROAD, BOOTLE, LIVERPOOL.

LONDON AND SOUTH EASTERN COUNTIES:

PATRICK H. KIRKALDY (CHAIRMAN), O. L. BRADY, ARTHUR J. CHAPMAN, MISS E. M. CHATT, R. L. COLLETT, CECIL H. CRIBB, BERNARD DYER, F. G. EDMED (BOURNEMOUTH AND DISTRICT SUB-SECTION), NORMAN EVERS, R. G. GRIMWOOD, W. P. HARMSWORTH, E. M. HAWKINS, G. S. HEAVEN, S. J. JOHNSTONE, G. S. W. MARLOW, W. J. PALMER, RUSSELL G. PELLY, B. D. PORRITT, A. L. SCOTT, B. W. J. WARREN, MISS S. T. WIDDOWS, AND J. A. F. WILKINSON. HON. SEC. AND TREASURER: R. L. COLLETT, 27, WALBROOK, LONDON, E.C.4.

MANCHESTER AND DISTRICT:

L. E. VLIES (CHAIRMAN), E. B. ANDERSON, F. W. ATACK, DAVID CARDWELL, P. GAUNT, J. GRANT, T. A. HOLROYD, A. LAPWORTH, J. H. LESTER, F. W. LINCH, W. MARSHALL, S. E. MELLING, F. L. PYMAN, C. E. POTTER, L. G. RADCLIFFE, MISS RONA ROBINSON, AND W. D. ROGERS. HON. SEC. AND TREAS.: JAMES BARR, HILLSIDE, TOWNSCLIFFE LANE, MARPLE BRIDGE, DERBYSHIRE.

NEWCASTLE ON TYNE AND NORTH EAST COAST:

J. T. DUNN (CHAIRMAN), P. P. BEDSON, A. FLECK, C. H. RIDSDALE, J. E. STEAD, C. J. H. STOCK, AND T. WALLACE. HON. SEC.: J. H. PATERSON, NEVILLE CHAMBERS, WESTGATE ROAD, NEWCASTLE-ON-TYNE.

SOUTH WALES:

F. J. BLOOMER (CHAIRMAN), J. W. ADYE, E. ANDERSON, J. E. COATES, T. EYNON DAVIES, C. M. W. GRIEB, AND C. A. SEYLER. HON. SEC. AND TREAS.: ARTHUR J. SHELTON, 10, PARK ROAD, CLYDACH, S.O., GLAM.

BOARD OF EXAMINERS FOR THE ASSOCIATESHIP AND FELLOWSHIP, 1921-22.

Chairman : THE PRESIDENT.

Members of Council : ERNEST MOSTYN HAWKINS, PATRICK HENRY KIRKALDY, AND BENJAMIN DAWSON PORRITT.

GENERAL CHEMISTRY :

Examiners for the Associateship :

OSCAR LISLE BRADY, B.A., D.Sc.
SAMUEL SMILES, O.B.E., D.Sc., F.R.S.

Examiners for the Fellowship :

Branch A.—INORGANIC CHEMISTRY :

Section I. Mineral Products : JOHN THOMAS DUNN, D.Sc

Section II. Metallurgy : CECIL HENRY DESCH, D.Sc.

Section III. Manufactured Products : (as required.)

Branch B.—PHYSICAL CHEMISTRY : JOSEPH EDWARD COATES
O.B.E., D.Sc.

Branch C.—ORGANIC CHEMISTRY : JOCELYN FIELD THORPE,
C.B.E., D.Sc., F.R.S.

Branch D.—AGRICULTURAL CHEMISTRY : BERNARD DYER,
D.Sc.

Branch E.—CHEMISTRY[?] (including Microscopy) of Food and
Drugs and Water : EDWARD HINKS, M.B.E.,
B.Sc. ; Therapeutics, Pharmacology and
Microscopy : FREDERICK GOWLAND HOP-
KINS, D.Sc., M.B., F.R.S.

Branch F.—BIO-CHEMISTRY : ARTHUR HARDEN, D.Sc., F.R.S.

Branch G.—CHEMICAL ENGINEERING : (As required.)

HON. AUDITORS :

HENRY DROOP RICHMOND AND CHARLES THOMAS ABELL,
M.Sc.

AUDITOR :

DAVID HENDERSON, Chartered Accountant.

REGISTRAR AND SECRETARY :

RICHARD BERTRAM PILCHER, O.B.E., Chartered Secretary.

ASSISTANT SECRETARY :

GEORGE STANLEY WITHERS MARLOW, B.Sc., F.I.C.

Forty-Third Annual General Meeting

TUESDAY, MARCH 1st, 1921.

The forty-third Annual General Meeting was held at 30, Russell Square, London, W.C., on Tuesday, March 1st, 1921, Sir Herbert Jackson, K.B.E., F.R.S., President, in the Chair.

The Secretary read the Minutes of the last Annual General Meeting, which were confirmed.

Mr. E. W. Voelcker, the Honorary Treasurer, moved "That the Financial Statements for the year 1920 be received and adopted, and that the thanks of the members be accorded to the Auditors for their services."

The Hon. Treasurer said that the past year had been a very anxious and trying one; the Institute had been faced with heavy additional expenditure due to the abnormal rise in the cost of labour and materials and to the increase in its activities. The Roll of the Institute was rapidly growing, but he thought it was hardly recognised that the additional income from annual subscriptions was absorbed to a very considerable extent by the corresponding expenditure on the necessary staff, printing, stationery, postage, and similar matters. Throughout the year the staff had been very actively engaged and had worked splendidly.

The Statement of Accounts represented the close of a period of nearly twelve years during which they had been concerned with the Building Fund. About six of those years had been passed under abnormal conditions owing to the war, and the Institute was most fortunate in not having to face the problem of building under existing conditions. The Building Fund was now closed, and a sum of nearly £1500 had to be debited to the general account, which debit, however, was covered by contingent legacies. There were a few contributions still to come in for the Building Fund, and he hoped that any members who had overlooked their promises would not consider that because the fund was closed their contributions would not be welcome. The Finance Committee hoped and believed that the worst of the abnormal economic period was over; prices were undoubtedly coming down, and although it would be necessary most carefully to watch all the expenditure, the Finance Committee looked forward to more normal conditions under which the annual income of the Institute would be

sufficient to meet the necessary expenditure. The increased expenditure consequent on the issue of the Journal six times a year instead of four, as in previous years, had been heavy, but by a change in the printers more satisfactory terms had been obtained than before. It would be noticed that the examinations still continued to cost a good deal of money. It must not be expected that they should be a source of income: at present, on the contrary, they were a considerable financial liability—he would not say loss, because ultimately they should be a gain to the Institute. The sum received in annual subscriptions had increased by about £500, and it was pleasant to see that the amount received in dividends and interest showed a substantial increase. With regard to the assets, it would be seen that unfortunately, as was the case with all securities, there was a considerable falling off in capital value. For that reason amongst others any spare money was now put on deposit at the bank. That had the great advantage of bringing in 5 per cent. interest without any loss of capital. Almost every investment possessed by the Institute if realised would result in a loss of capital, and that was one of the principal reasons why the excess of assets over liabilities was lower than it was last year. The difference, however, was not very serious, and, as the Institute would not be obliged to realise its investments, it was not of grave consequence. Most of the investments were terminable securities which some day it was hoped would be paid back at full par value. Where the Committee had been able to save they had done so; he thought they had been fairly successful, and altogether that the members were to be congratulated on having got through a very difficult and trying year remarkably well.

He made an earnest appeal to the Fellows and Associates to support the Benevolent Fund. In order to be of real practical value, the Fund should have an assured annual income. If members would send even quite a small annual contribution to the Fund it would in a comparatively short time mount up so as to be really useful. With something like 4,000 Fellows, Associates and Students paying 2s. 6d. a year each it would at once give an income of £500 to meet emergencies. He urged all members in sympathy with the Fund to make it a practice to enclose a small contribution for the Fund when they sent in their subscriptions.

Dr. G. McGowan, in seconding the motion, said it must be obvious to everybody that the care of the finances of the Institute was no sinecure at the present time. He thought the Treasurer and the Finance Committee were to be congratulated on the success with which they had carried the Institute through a very difficult year.

The motion, including the vote of thanks to the Auditors, was carried unanimously.

Mr. James Connah thanked the members for the vote of thanks that had been passed to the Auditors. As he was the only representative of the Auditors present, he would say on their behalf and his own that the work had been a labour of love, and had been really very much reduced since the Honorary Auditors had had the services

of a professional chartered accountant. Also he could testify to the very strong interest which Mr. Droop Richmond had taken in auditing the accounts, and could assure the members that they had a very valuable asset in his being an Auditor. He himself had had some years of the work now, and was anxious to retire, and in doing so he wished to thank the Treasurer and the Registrar for the great help they had given him in the little work he had done.

On the proposition of the President, Mr. G. I. Higson was appointed a Scrutineer to examine the voting lists for the election of Officers and Council, and on the proposition of Miss E. M. Chatt, Mr. Abell was appointed as the second Scrutineer.

In accordance with Bye-Law 60, the Council had nominated the following Fellows from whom four Censors had to be elected :—Sir James Johnston Dobbie, LL.D., F.R.S., John Thomas Dunn, D.Sc., Bernard Dyer, D.Sc., Sir Herbert Jackson, K.B.E., F.R.S., Sir Robert Robertson, K.B.E., D.Sc., F.R.S., and Prof. William Palmer Wynne, D.Sc., F.R.S. Ballot having been taken, it was agreed that the Scrutineers should also act in connection with the voting for the election of censors.

The President moved that the Report of the Council for the year ending March 1st, 1921, be received and adopted. (See p. 103.)

He directed attention, however, to an error in the Report on page 15. Against "Branch (d), Organic Chemistry," he said that the figure "0" should be "6"; six candidates had been examined, of whom four passed. The total at the bottom should be increased from 32 to 38.

Sir William Tilden seconded the motion and associated it with another motion on his own account, to the effect that the President be requested to allow his address to be printed and published in the Journal. He said it had been a source of considerable regret to him that, owing to circumstances, to which he need not refer further, he had been prevented during the last few years from attending meetings of the various Committees and bodies acting in the Institute. He did not know how to excuse himself except on the ground of advancing years. Those who had read Rudyard Kipling's *Kim* would remember that the old Llama was continually declaring that he had acquired merit by doing something or other; the old Fellows of the Institute seemed to acquire merit by standing still. He had watched the progress of the Institute with very great interest, and sometimes with

a little anxiety. There was one feature, however, in which it had undoubtedly changed wonderfully for the better since the days when he took a more intimate part in its affairs. An Annual General Meeting nowadays was a peaceful and pleasant meeting of friends and associates and the meeting was not disturbed by dissentients of a more or less turbulent character. That was also the experience of Institutions of a similar kind. It was due largely to the success of the operations which had been instituted and carried out by the Council under successive Presidents. The members were under great obligations to the President and Council for their work, and to the President for the dignity he had maintained and the activity he had shown during his three years of office. He had no justification for criticising anything which had been said that day, but he happened to notice one subject upon which he hoped the Institute would concentrate further attention, and that was the difficult question of the supply of fine chemicals or research chemicals to the chemical world. Although he was removed from temptation himself, being no longer able to work in the laboratory, he had been distressed to find that some of his eminent friends had been buying chemicals from Germany, whereas if there were a proper system in this country of cordial co-operation he believed the supply could be found here. The Institute had taken a step in the right direction by encouraging many teaching institutions and he hoped they would press forward and obtain more cordial co-operation amongst those bodies. With regard to the loss that the Institute had recently suffered from the death of the Senior Past President, he would like to add just a word because he was known personally to Dr. Odling for upwards of fifty years and in the days of long ago owed to him a good deal of friendly encouragement. Being in Oxford in the early part of this year, he called upon Dr. Odling, and was glad to say that not only did he recognise him, but he remembered him as a very old friend, and his voice was so strong and his eyes so bright and his mental activities so unchanged that he hoped he would be able to report to the Institute that he was pretty well. A month later he passed away. Dr. Odling had told him that he got on very well until he had passed his ninetieth birthday; at the time of his death he was nearly 92, and it was no doubt the burden of years which led to his death.

Mr. G. Rudd Thompson said that under the proposed alteration of By-Laws and Rules for the election of District Members of Council he would like to be informed where the county for which he had the honour of acting as Public Analyst, namely, Monmouthshire, was placed, because he failed to find any allusion to it in the list. It might be perhaps incorporated under No. (ix) Wales. If so, he must protest. (Laughter.) He was not a Monmouthshire man, but he had lived there for a few years. There was a very strong feeling for and against the incorporation of Monmouthshire in Wales, and also there were Acts of Parliament, Rules and Regulations which were expressly mentioned as taking effect for Wales and Monmouthshire. As the Annual Meeting was the only opportunity of members of the Institute to come before the Council and criticise their actions, he would like to refer to a point on page 39 of the Journal, in connection with the appointment of a Public Analyst for Brighton. It was stated in the Report that a recom-

commendation was sent out jointly from the Institute and the Society of Public Analysts, expressing the hope that the members of the Institute would refrain from applying for the appointment. It occurred to him to ask, what would be the position supposing a man, notwithstanding the expression of opinion of the Institute, applied for the position, although he might or might not get it. He had been struck with one particular phrase in the President's address,—that the Institute was not for selfish ends, but that members should help one another. It seemed to him that the Council should have powers, if they had not already got them, to show the displeasure of the Institute when any man disregarded such a letter as had been sent out. It was all very well to say the Institute did not want a man to take the position, but supposing a man did accept it? He hoped that the Council would not misinterpret his remarks, as he was not present as a captious critic but simply to express the views of some of the junior Fellows of the Institute. It was worse than useless for the Institute and the Council to say that they were for the protection of the profession if after having sent out a letter of warning, they took no action. He thought it was a point the new Council should bear in mind, because it was an important one, and one which must be considered in the true interests of the Institute, especially having regard to the younger members of the Institute who had not the benefit of the years of experience which the older members possessed.

The President said he did not comment upon that matter, as it was not ripe for comment yet. He thought Mr. Thompson might rest assured that the Council would be obliged to him for his remarks, and would take them into consideration. With regard to the question as to where to put Monmouthshire, perhaps Mr. Thompson could suggest something.

Mr. Thompson said he was not a Welshman, and therefore would not include Monmouthshire in Wales.

Mr. John Hughes said that in Acts of Parliament specific provision was made for "Wales and Monmouthshire." That gave a great prominence to Monmouthshire, and on that account, being a Monmouthshire man, he did not feel that there was any disadvantage in Monmouth being coupled with Wales.

Mr. Thompson said he suggested it should be: "No. (ix) Wales and Monmouthshire," and it would then be in conformity with Acts of Parliament.

The motion for the reception and adoption of the Report was then put and carried unanimously.

The President agreed to allow his address to be printed in the Journal, and thanked the meeting for accepting Sir William Tilden's suggestion in that respect.

He was sure the members welcomed the presence of their Past President (Sir William Tilden). It was a good thing for the members

to have among them men of such experience to whom the Council could turn for advice and help when necessary.

On the proposition of the President, Mr. Droop Richmond was reappointed as one of the Honorary Auditors.

The President mentioned that Mr. Connah was retiring, and he wished to take the opportunity of moving a special vote of thanks to him for all the trouble he had taken in the past seven or eight years in acting as one of the Auditors.

The motion was carried unanimously.

On the motion of Mr. F. H. Lees, seconded by Mr. C. E. Barrs, Mr. C. T. Abell was elected an Honorary Auditor in the place of Mr. Connah.

The Hon. Treasurer moved that Mr. David Henderson, chartered accountant, be re-appointed Auditor and that his remuneration be 20 guineas instead of 15 guineas, in view of the increase in the amount of work that the accounts involved. He said that Mr. Henderson kept periodic check on the accounts, and he did not think 20 guineas was too much to suggest.

Dr. Bernard Dyer seconded the motion, which was carried.

The President said he had received the Report of the Scrutineers duly signed by them, and declared that the Officers and Members of Council nominated on the ballot list were duly elected. (See p. 89.)

The President announced that the Scrutineers had reported the following gentlemen elected as Censors:—Sir James Johnston Dobbie, LL.D., F.R.S., Bernard Dyer, D.Sc., Sir Herbert Jackson, K.B.E., F.R.S., and Sir Robert Robertson, K.B.E., D.Sc., F.R.S.

Dr. J. A. Voelcker moved a vote of thanks to the retiring President, Vice-Presidents, and Members of Council.

He thought the President ought to have a vote of thanks all to himself. In a letter he had received from a distinguished member apologising for absence, that member wrote: "I should like on an appropriate occasion to support a vote of thanks to the retiring President. During his term of office the Institute has made great advances in extending and perfecting its organisation. Its influence has also

markedly increased and its advice has been sought by many bodies and Departments. This extension of its usefulness, as those who have had the opportunity to sit at the Council table will know, has been fostered in a marked measure by the President. Many instances will be realised by those who sat around the table, of difficulties which were smoothed by his sound advice and of troubles which were removed by his diplomacy and tact." That described better than he could what the President had done, and he was sure that in thanking those who were retiring the members would think especially of Sir Herbert Jackson. The chief work the Institute had done of late years had been in perfecting its organisation and extending its influence, and in both those spheres the President had been a noble leader and a hard worker. With it all he had combined a personality which had made him act always so genially and had made him such a friend to all that the parting with him as President was very hard indeed. While they rejoiced at the honours both public and scientific which had been accorded to Sir Herbert, he thought, and he believed Sir Herbert would think too, that not least of those honours had been that of being President of the Institute of Chemistry. It had been a pleasure to see Sir William Tilden present that day. Sir William's portrait was on the wall and now a portrait of Sir Herbert Jackson would join the gallery of those who had so worthily served the Institute. The Council had spent an immense amount of time and trouble on the work of the Institute. Pleasant meetings, such as the one of that day, did not take place unless there was peace at home, and that peace had been brought about by hard work and by everyone doing his very best for the Institute. Therefore they took the present opportunity of according to the retiring Members of Council and to the President and Vice-Presidents their best and warmest thanks.

Mr. G. Rudd Thompson, in seconding the motion, wished to add his personal thanks to the retiring President for the kindly advice he had given him during his term of office. Sir Herbert had given him valuable assistance, which he should never forget and for which he was deeply grateful. With regard to the work of the Council, in reading the Reports, he realised the vast amount of work the Council had had to perform during the three years they had been in office. Such work could not possibly be done unless an infinitude of time and trouble was bestowed upon it. The members simply judged the work of the Council by the results, and anyone who had seen the wonderful progress of the Institute during the last three years was bound to come to the conclusion that the Council had done their work well, and he expressed the hope that the new Council would do likewise.

The motion was carried with acclamation.

Sir Herbert Jackson, the retiring President, returned thanks.

He said he had not deserved a tenth of what had been said, but he could say of the retiring Members of Council that they had more than deserved every word. He had tried in his remarks to point out the

work the Council had done. It would be impossible to have presided over a body of men who threw themselves more wholeheartedly or with greater loyalty and enthusiasm into their work. He agreed that having been President of the Institute was the highest honour he expected to reach. He had been proud to be the President. In the name of the retiring Members of the Council and in his own, he was very grateful for the vote that had been passed.

Sir Herbert Jackson then left the Chair, into which he inducted the new President, Mr. Alfred Chaston Chapman.

Mr. Chapman said that he wished to express his very sincere thanks and deep appreciation of the great honour that had been done him in electing him the President of the Institute. It had already been said that afternoon, and personally he thought everybody would agree, that a professional man could not receive any greater honour, nor could he perhaps experience any keener gratification or satisfaction, than that of having been elected to the Presidency of his own professional body, implying as it did the goodwill and the confidence of his professional brethren. When it was first suggested to him that he should allow his name to be put forward, he hesitated considerably. He felt in the first place that there were others who were far better qualified to fill the position, and also as a busy man that perhaps he ought not to accept nomination to a position the duties of which might demand a much greater amount of time and energy than he could well afford. A further consideration was that the retiring President had raised the standard of attainment to such a high level that he had rendered the task of his successor especially difficult. Some very kindly, reassuring, and soothing representations were made to him, and in accepting nomination he was very largely influenced by his confident belief that he would receive that loyal support from the Officers and Members of Council and from the members of the Institute which had always been accorded to his predecessors in the Chair. He also felt that he might confidently turn on occasions of difficulty or doubt for advice and help to his old friend, Sir Herbert Jackson. He assured the members that he would do his best. If he made mistakes, as he almost certainly would, and if he fell short of his ideal of what a President of the Institute ought to be and ought to do—as he very certainly would—he would in all sincerity beg the members to be as indulgent to him as possible, and to remember that his sincerest endeavour and earnest desire at all times would be, as they had always been, to do everything that lay in his power to further the interests and to promote the welfare of the profession of chemistry in this country. His very best services would be always placed unreservedly and freely at the call of the Institute, and he could hope for nothing better than that, at the end of his term of office the members might be able to say: "Well, at any rate, he did his best." (Hear, hear.) Once again he desired to thank the members sincerely for his election. (Cheers.)

The meeting then terminated.

Address of the Retiring President.

MARCH 1st, 1921.

SIR HERBERT JACKSON, K.B.E., F.R.S.

The Report summarises the work of the year, most of which has already been covered by the information given in the Journal. For that reason I do not propose to deal with the Report in detail but merely to offer a few observations on some of the main subjects of interest, and then, if you will allow me, I will briefly review the work of the last three years and say a few words as to the future.

The increase in the number of members and students may be regarded as highly satisfactory, although our losses by death have been somewhat severe.

In my address last year I referred to Mr. Walter Fisher and Mr. Charles Groves, who died shortly after the issue of our Annual Report. The list before you contains the names of several chemists of mark in various departments of work ; among teachers, Dr. William Hodgson Ellis, Prof. Edward Kinch and Prof. Lucius Trant O'Shea ; amongst industrial chemists, Dr. Jacob Grossman, Mr. Archibald Hall, Dr. Rudolph Messel, Mr. Charles Clifton Moore, Mr. Julius Ostersetzer, Mr. John Ruffle, Dr. John Shields, Dr. Adolph Ulrich, and, since the Report was written, Dr. John Cannell Cain ; among metallurgists, Mr. Henry Kelway Bamber and Mr. Henry Bassett ; and from the Government Chemical Service, Mr. George Lewin and Mr. Charles Simmonds ; and among those who were associated with journals devoted to the literature of our subject I must mention again Dr. Cain and Prof. Watson Smith ; and here I think I should include Mr. Samuel Archibald Vasey, who was for many years associated with *The Lancet*. Two other names of special interest—

those of Percival Spencer Umfreville Pickering and John Emilius Lancelot Shadwell—recall men who devoted their lives to research.

In view of the discussions which have taken place from time to time on the suggestion that the Institute was intended primarily for consulting and analytical chemists, it may be worth while noting how few of the above could be regarded as coming properly within that category, and yet without exception each was truly a chemist in the broad meaning of the word and fully entitled to his place on our Roll.

By the death of Dr. Odling, which has occurred since the publication of the Report, we lose from our Roll the name of a Past President to whom we have been specially indebted, because he was in office at the time that the Institute received its Charter. He was an Original Vice-President, and held office as President for five years—from 1883 until 1888. He subsequently served for a further period of three years as a Vice-President, and was for two periods a Censor. Gifted to a remarkable degree as an orator, he delivered addresses to the Institute to which we can turn for useful guidance on almost any point which may relate to its original aims and objects. At the time of the Petition for the Charter, he had to face opposition from those who openly deplored the proposal to incorporate under authority from the Crown a body of men who practised chemistry for their livelihood. Dr. Odling made a strong defence, much of which is reproduced in the official History of the Institute and is well worth while reading at the present day, when we find the profession in a very different position, a position for which in a large measure we owe him our gratitude. As a man he was a genial and delightful friend, as a chemist he was a great teacher, and was for over forty years Waynflete Professor at Oxford. Here his name will ever be held in honoured and grateful memory. (Hear, hear.)

Under Section 2 of the Report, after the list of Committees, particulars are given of service rendered by representatives of the Institute on various Committees and Boards concerned

with Government Departments and other public bodies. These particulars are significant of the increasing recognition of the importance of chemistry in public affairs and of the Institute as a public institution; and, with reservations so far as I am personally concerned, I feel sure that the Fellows and Associates will agree that the Institute has been well served by its representatives in connection with their work on the various bodies with which they have been associated.

Throughout the war and since the armistice the chartered professional bodies generally have been able to render the State valuable service, and there is no doubt that Government Departments, some of which were formerly inclined to regard the representations of such bodies as mainly prompted by individual interests, have realised that they are actuated by a sincere desire to promote the public welfare. It must be admitted that, in pressing the claims of official chemists for adequate remuneration, there is some difficulty in inducing the Treasury in a time of unusual stress to realise that if the State is to have the services of a due proportion of the best talent available the conditions of their appointments must be reasonable and commensurate with their standing as professional men. We are glad that such questions have received attention, not only in the interests of those who are directly concerned but also because such action on the part of the Government is an encouragement to the coming generation of chemists to follow a career of essential and vital importance to the needs of the country. As an Institute, too, we are glad to have been called upon to send representatives to deliberations of the Departments concerned.

With regard to glass research, we have left the investigatory work to the new organisations which have been formed. We have published the schemes framed by the Glass Research Committee for testing laboratory glass and porcelain and have taken action consistent with our views in the hope that the industries which so closely affect the profession will be firmly established in this country.

Matters of finance I have left to the Honorary Treasurer, to whom we are so much indebted for his loyal and able guidance—(hear, hear)—but I should like to make two remarks: first, that if anyone had any doubt as to the advisability and need for raising the amount of the annual subscriptions of the members two years ago I think time has proved the foresight and wisdom of the Honorary Treasurer in that matter; secondly, I think the management of the Building Fund has been highly satisfactory from its inception twelve years ago until its closing. To have raised the necessary sum and to have completed the building in the face of all the difficulties with which we have been encountered, and, in the long run, without drawing upon the slender reserves of the Institute are matters for congratulation, and I feel sure will give satisfaction to those who have contributed to this result. (Hear, hear.) The building has been raised by sheer hard work and perseverance. It will last the time of the present generation and of a few more generations, and will serve its purpose so long as we remain unmolested by outside agencies. In addition we are providing a Redemption Fund for the use of future generations, from which I trust they will reap the benefit, and, while being grateful to us for the provision they will inherit, will make the like provision for their successors. This is looking ahead, and I think most of you will agree that in all organisations of this kind much of the work lies in labouring for posterity; but while we are working for the future we must be mindful of those who did the pioneer work of the early days and of their successors who have carried it on. We have happily some still with us, after the 44 years of our existence, to whom I know that the progress of the Institute is a source of real pleasure. While on the subject of our premises, I should like to say that the House Committee is careful to see that they are put to good purpose and to maintain them in good repair. The laboratories and meeting rooms are in greater use than a year ago. The number of members who visit the Institute and make use of its library is steadily increasing. Members

from the country or abroad who are temporarily in London constantly look in at their headquarters and are always welcome.

The General Purposes Committee have done the main work of revising the By-Laws, and well deserve our thanks. The expense will be considerable, but, I am pleased to say, thanks to the action of our Registrar, substantially less than was anticipated, since, on his representation, the Privy Council have waived strict compliance with a Clause in the Charter which required the Institute to publish the new By-Laws *in extenso* in the Official Gazettes. Moreover, if we do not have to undertake revision again for another twenty-five years we shall not feel the burden unduly. In any event, I hope that the changes made will be for the benefit of the Institute.

The bulk of the alterations were merely verbal and elucidatory, the chief reason for the revision being to introduce changes in our organisation more suitable to the increased membership, and to frame other rules rendered necessary by the trend of opinion and the views accepted during the past quarter of a century. These changes affect very largely the question of securing adequate representation on the Council of all the varied interests of the profession and of all parts of the country, providing even for the election of a Fellow to represent members in overseas Dominions and elsewhere abroad. A constantly growing and active organisation such as the Institute can, I think, find plenty of work for 45 Members of Council, and it rests with the general body of Fellows and Associates to send to the Council those who will earnestly devote themselves to the business.

Another change is to restrict, so far as all future elections are concerned, the membership of the Institute to British subjects. This change was made not merely to avoid complications arising from a state of war, but in order to put on a more definite basis the principle long accepted by the Council that the Institute is essentially a British Institute, although a few foreign candidates who had been trained in this country,

or had definitely established themselves in practice here, had been allowed to take the examinations. In future, however, the membership will be restricted to British subjects. (Hear, hear.)

A further alteration which calls for special mention is the introduction, in By-Law 57, of a more specific indication of acts which are regarded by the Institute as discreditable to the profession within the meaning of Section 16 (3) of the Charter. The new By-Law is not intended to limit the interpretation of the Charter nor to fetter in any way the absolute discretion of the Censors in dealing with complaints which may be submitted for investigation, but this is an alteration of the highest importance, especially in the light of the practice which has obtained in other countries where the requirements of professional ethics have been less strict. The Institute is called upon to ask from its members the general acceptance of certain principles of conduct without which the profession would undoubtedly tend to degenerate. The standard of conduct maintained by British chemists certainly during the last quarter of a century has been comparable with that of the best traditions of other learned professions, for, although the Censors may occasionally receive a complaint, glaring examples of indiscreet acts are rare. Being rare they attract usually more attention than they deserve, but we should all be glad if they never occurred, for one ill-considered action in the way of an advertisement, a trade puff or the like, apart from the odium which it brings upon the offender, does harm to the status of the whole profession. It is true that the complaints for investigation are few, but one is one too many. The rule of duty is for the most part clear ; we are not here solely for selfish ends, but to help one another. A member who knowingly offends against the principles accepted by his profession breaks faith with his brethren and, if he should happen to be a man of established position, creates an evil example for those who are younger. Let each man justly value himself, and act up to his worth if he wishes to maintain his position and the good opinion of his fellows.

As a means for the further organisation of the Institute and the promotion of its objects, the formation of Local Sections is also ratified by the new By-Laws. The Local Sections should be developed and I would appeal to all Fellows and Associates so far as they are able to take an active part in this development.

The new By-Laws should fairly represent the wishes of the members, since the views of Local Sections and of Honorary Corresponding Secretaries have been duly considered ; and I may mention, moreover, that our legal advisers and the General Purposes Committee have closely studied the By-Laws of other chartered professional bodies, in order to incorporate in our own any principles which appeared to be advantageous.

The work of the members of the Nominations, Examinations and Institutions Committee has continued heavy throughout the year. They have held 30 meetings and have been most assiduous in keeping their work well in hand, thus avoiding undue delay in reporting on the applications of various kinds which came before them. They have often had a difficult task in deciding upon these matters, but they have regarded the provisions of our Charter and Regulations, as well as the spirit in which those Regulations must be interpreted, in the light of the discussion which took place at the Extraordinary General Meeting held in April, 1918, shortly after I succeeded to this Chair.

A difficulty was anticipated and has now to be faced in dealing with applications for election to the Fellowship from Associates elected since the principle was adopted of exempting from examination candidates who have obtained Science Degrees, with First or Second Class Honours in Chemistry, or Diplomas of similar standard. The number of such applications received up to the present time has not been large, and I suspect that a considerable proportion of those Associates who have completed the requisite period are watching the decisions of the Council before venturing to put their own claims to the test. Referring to what I promised

in the name of the Council three years ago, I would remind these Associates that, while a concession was willingly made to fall in with the views of the great British Schools of Chemistry so far as the Associateship was concerned, the Institute as a body has not authorised the Council to make concessions with regard to the Fellowship outside the promise to which I have already referred. (Hear, hear.)

The meeting in April, 1918, was held to determine how the Institute should modify its procedure to bring it into harmony with the developments which had taken place in our whole educational system since the foundation of the Institute, and to consolidate it firmly as the central representative organisation for the whole profession of trained and competent chemists. The meeting had to determine the interpretation of the words "trained and competent," and the Council had to act in accordance with that interpretation. Now I will quote what was virtually decided in the case of a candidate for Fellowship—"It was that, before a man was hallmarked with the Fellowship of the Institute, it must be ascertained that he was a trained expert, and, in the absence of the evidence furnished by the Institute's own examination, the proof required of his right to be called an expert and to be admitted to the Fellowship must be such as to be really conclusive." Again—"the Council must see that there was no question of proceeding to the Fellowship 'automatically,' or merely by efflux of time, but that the case of every candidate for the Fellowship must be most jealously investigated." The Regulations for the Fellowship require the candidate to produce evidence :—

- (a) That he is not less than 24 years of age ;
- (b) That since his admission as an Associate, and for a period of three years therefrom, he has been continuously engaged in the study and practice of chemistry in a manner satisfactory to the Council.

Every such Associate will be required to pass an examination

in one of the specified branches, or to produce evidence satisfactory to the Council :—

- (i) That he has carried out original research of sufficient merit ;
- or (ii) That he has devised processes or inventions of sufficient merit ;
- or (iii) That he is possessed of knowledge and ability equivalent to having fulfilled the conditions contained under (i) or (ii) above.

It was agreed that the candidate who sought election to the higher grade without examination should be required, therefore, to furnish proofs of outstanding ability. The Council has no intention of departing from that decision. The view was expressed and accepted that the admission of Associates to the Fellowship without examination should be not the rule but the exception, and that the Fellowship of the Institute should continue to be the highest possible qualification for a chemist in the full meaning of the term as we understand it. We had hoped that our new Associates would be spurred to high effort to gain the Fellowship, and that not a few would produce work which would advance the credit of British chemistry, and perhaps it is early yet to say that this will not prove to be the case. Some of those who have applied for the Fellowship on the strength of their original work have indeed satisfied the special assessors appointed by the Council to examine their work, but, on the other hand, we have been obliged to decline the applications of several, who, we hope, will not be discouraged but will either take the examination or else make a further effort to produce work up to the necessary standard.

Our thanks are specially due to Members of Council and others who have assisted us in the work of assessing the papers received, work which is often heavy and is highly responsible.

I am a little diffident about making distinctions between members of the Nominations, Examinations and Institutions

Committee, who have all worked so well, but I owe it to Mr. E. M. Hawkins—(cheers)—who, although resident in the country, has never missed a meeting, and has so frequently occupied the Chair in my absence, to express my grateful thanks to him for the able manner in which he has conducted the business of the Committee; and I should mention also Prof. Morgan, who has often come specially from Birmingham to attend the meetings and whose help has been of such great value in interviewing candidates for membership. (Hear, hear.)

Examinations under the new Regulations are hardly yet in operation, but we may anticipate that the number of entries will be increased during the coming year. The Board of Examiners will be reconstituted and augmented by the addition of three members of the Nominations, Examinations and Institutions Committee, acting *ex officio*, in order to provide a link between the Board and the Council, but not with a view to limiting the responsibility of the Examiners in the control of the examinations. The Nominations, Examinations and Institutions Committee is also empowered to invite members of the Board of Examiners to attend meetings of the Committee.

The Public Appointments Committee have again had a busy year and have done much useful work under the Chairmanship of Mr. Chaston Chapman. This is work often of a difficult character in that it aims, in many instances, at inducing authorities having little acquaintance with science to have a higher appreciation of the importance of chemistry in public affairs. The Government Departments have in recent years, as I have already indicated, shown increasing interest in such matters, and we now invariably receive from them a sympathetic hearing of our representations. With the majority of Local Authorities also we have lately, though to a more limited extent, succeeded in connection with our representations on the question of the remuneration of public analysts. On the other hand, we have been less successful with regard to the terms of new appointments; but the result

has been due not to want of effort on the part of the Committee or of the Council, but to the lack of complete support from the profession. I do not propose at the present juncture to comment on a recent instance, since the matter is not yet fully determined; but I do appeal to the Fellows and Associates to support the Council of the Institute and that of the Society of Public Analysts, who have been associated with us in dealing with some of these matters, when they make a specific announcement of policy with reference to proposed appointments. (Hear, hear.)

The endeavours of the Special Research Chemicals Committee have been appreciated by chemists who have been assisted to obtain substances required for research purposes through the Institute acting as a "clearing house." The Institute has also rendered some help to manufacturers of such substances by reporting from time to time on the progress made in their production.

The Report of the Services Committee contained a well-considered scheme for utilising the services of chemists in the event of war. It is in many respects equally applicable to physicists and other men of science, and has been transmitted therefore to the Conjoint Board of Scientific Societies.

Our Honorary Corresponding Secretaries have helped us, as I have said, with the revision of the By-Laws, and we have been in communication with some of them on other matters. Arising out of a proposition on the part of the Australian Chemical Institute to apply for a Royal Charter, we have expressed the opinion that, where it is proposed to establish a qualifying body in any other part of the Empire, the standard of training and examination should be as high as that of the Institute at home. We feel that it is important to maintain this principle, especially in the event of recognition being accorded by the Crown in the form of a Charter, since it is desirable that the members of our Institute and of Chemical Institutions in overseas Dominions should be reciprocally accepted as qualified to practise in any part of the British Commonwealth. This matter has not been referred to in the

Report, because it is not yet sufficiently far advanced ; but, in view of the important principle involved, I mention it now on the chance that any member from Australia may be present or that others may wish to comment on it.

On the subject of our Appointments Register I do not need to dwell except to say how remarkable the position of our profession appears to be compared with many others. Even although the recent depression in industry has resulted in many concerns terminating the appointment of numbers of chemists, there are to-day less than 50 without employment out of 3,300 on our Register. This is a branch of our work in which we must all co-operate by helping, so far as we are able, to ensure the constant employment of all our members.

I am reminded that unemployment often means distress, and it is a matter for general satisfaction that we have now instituted a Benevolent Fund for the help of any of our members or their dependents who may need assistance. (Hear, hear.) I hope that no member in want will fail to call upon the Fund, and that every member who is able to do so will support the Fund, in order that we may be in a position to deal with applications liberally. Under the Chairmanship of our Honorary Treasurer, I am sure that the Benevolent Fund Committee will administer the contributions placed at their disposal with discretion, and will find real pleasure in helping those to whom assistance promptly given may mean so much.

The Legal and Parliamentary Committee, under the Chairmanship of Mr. Horatio Ballantyne, has carefully watched legislation affecting chemists, and the Council have acted on the advice of the Committee in several matters which have been duly reported.

The judgment of Mr. Justice Peterson was naturally a subject of much interest to chartered bodies, but we may rest assured that the Institute has a clear conscience on that account. President after President has impressed upon you the fact that the Institute is what its members make it : you are the Institute and must frame, through your Council, its

policy, and determine the limits of its functions. I am certain, however, that it has throughout its existence fulfilled the purposes for which it was incorporated and will not attempt to embark upon any venture which lies outside its powers. Our ideals and our policy must be kept constantly in mind, and we must work patiently and persistently towards their attainment and fulfilment.

A new question of policy has been raised recently in the Council, on a motion by Mr. Macnab, whose election as a Vice-President, which I anticipate will be announced shortly, will be a source of great satisfaction to us all. (Hear, hear.) His remarks, reported in the *Journal*, with regard to the place of the Institute in the affairs of the country cannot be too widely read. They were endorsed by his colleagues on the Council, and express clearly our intention to take our part in all matters of public importance on which the Institute is entitled to be heard, as being the representative body of professional chemists and possessing the knowledge and experience necessary for guiding public opinion. For instance, in the matter of the supply of laboratory requirements, which are essential to the work of the chemist, and essential to chemical industries, I think we are agreed that this country should be rendered self-sufficing if that is possible. We are not concerned with the politics of this matter, but we realise its importance not only to the industry but also to the coming generation of chemists, and we feel entitled to express our opinions on that account. A Committee is therefore preparing a Memorandum which, if the Council approve, will be published.

The first year of the *Journal* in its extended form does, in my opinion, great credit to the Publications Committee and to its Chairman, Dr. Brady. Our aim in this direction, as it is in the formation of the Local Sections, is to maintain on the part of the members a lively interest in their profession, to foster the idea of fellowship and to bring to light and to discuss for our common good any matter of interest to the profession.

Having commented briefly on the various sections of the

Report for the year, I propose, on completing my term of three years' office, to give a very short summary of our work during that period. When I came into office the Council had determined upon the lines of policy to which I will now refer, and which were shortly afterwards endorsed by an Extraordinary General Meeting of the Institute:—

(1) To modify the Regulations in order to effect more completely the consolidation in one body of properly trained and competent chemists in all branches of the profession.

The Regulations have been thoroughly revised to provide avenues to the membership for all who take steps to equip themselves for professional chemistry consistently with the standard prescribed in the Charter, thereby effecting closer co-operation between the work of the Institute and that of the Universities and Colleges.

The figures for our Roll of Membership in the Reports for the years 1917-18 and 1920-21 are as follows:—

	1917-18.	1920-21.
Fellows	1356	1562
Associates	491	1708
	<hr/>	<hr/>
Totals	1847	3270
	<hr/>	<hr/>

an increase of 1423 Members.

Incidentally the Roll of Students shows the figures:—

1917-18.	1920-21.
370	799

an increase of 429 Students.

(2) The formation of Local Sections.

Ten Sections have been formed, of which the majority are decidedly active and doing remarkably good work.

(3) To review the system of election to the Council in order to give the general body of members greater freedom of nomination.

This involved the revision of the By-laws, which has been taken in hand and completed, not only with respect to this matter but very thoroughly, as I have already indicated.

- (4) To extend the list of Institutions formally recognised for training candidates for the Associateship of the Institute.

The number of such Institutions has been increased from 43 to 52.

- (5) To revise the conditions for the admission of Students.

This has been provided for in the new By-laws and in the Regulations. I may add that the Council intend to arrange for further means by which Students of the Institute may be brought together. They hope also that Fellows and Associates will interest themselves in the Students and give them the benefit of their experience. The Council realise that the present students are prospective Associates, and will try to bring them into closer touch with the Institute.

- (6) To extend the publications and to keep members informed of the views and actions of the Council which represents them.

The Journal and Proceedings is now issued in six Parts annually instead of in four Parts.

- (7) To make further endeavours to bring before the public the importance of chemistry to the country, its industries and commerce, and generally to forward the interests of chemists in every way possible.

This, I maintain, has been the main business of the Council and Committees, as the last Report clearly demonstrates. If any member will take the trouble to glance through our records of the past three years, I think he will be surprised at the number and variety of matters in which the Institute has taken an important part.

What then has been our main work including the subjects specifically indicated above? We have made considerable

progress with the consolidation of the profession and we can look forward to the future with the knowledge that our position is thereby so much the stronger for taking any action which appears desirable in the interests of the profession. We have materially assisted members who served with the Forces or were otherwise engaged in the service of the country to become resettled in civil life, and, moreover, although we have adopted no methods inconsistent with our constitution, we have taken steps which have improved the general conditions of the employment of chemists.

The Institute keeps alive the corporate spirit of the profession, and is the means whereby the opinions and views of its members may find expression in matters of public concern. It is the officially recognised public body to which the country generally can turn for advice and guidance on matters relating to the profession. It represents that profession in matters of public importance. It provides a bureau of information and renders every possible assistance to those who intend to follow the profession of a chemist. It promotes and maintains the highest standard of training and competence for the profession and registers the trained and competent. It thereby provides competent professional service for the country. It promotes the strictest integrity on the part of its members in their dealings with one another and with the public. It fosters by every means in its power the status of its members. Time may bring about many changes—that is natural—but so long as the members make good choice of their Council and Officers, trust them and help them, they may feel confident that the Institute and the profession will continue to gain strength and prestige.

The Councils over whom I have had the honour to preside have been animated with the desire to further the good work of the Institute in every direction. It is not easy adequately to express the indebtedness of the Institute to the Vice-Presidents, the Treasurer and the Members of the Council whose report is now before you. They have given services

of the greatest value to the business of the Institute. The increase of this business has meant an expenditure of time and energy which has involved very considerable self-sacrifice on their part. The meetings of the Council and of the various committees have been many and long, but always has it been possible to get Members of the Council to devote themselves ungrudgingly to the work and to carry it wisely to a successful issue. There has been the spirit which must be fostered in every professional body; the spirit which impels men to actions yielding no individual reward, but done in the service of their profession and to keep alive its highest traditions.

I dissociate myself from the Council in paying a tribute of admiration to its members for their high sense of responsibility in the discharge of the duties entrusted to them, and I wish gratefully to acknowledge the support, consideration and kindness which they have invariably accorded to me and by which they have made the position of President often an easy one and always a pleasant one.

On this occasion, the completion of my last year as President, I desire to express my personal gratitude to Mr. Pilcher—(hear, hear)—for his valued help and for sparing me trouble in every way possible. On other occasions I have spoken of his exceptional devotion to the Institute, and of the debt which it owes to him for the extent to which he has so abundantly fulfilled his duties. It is necessary, however, to have been President to appreciate properly how much he means to the Institute, how firm a grasp he maintains of all its activities, and how, without ostentation, he plays his part, as Registrar and Secretary, in guiding the business of the Institute by the ability, loyalty and enthusiasm with which he carries on the manifold duties of his office both inside the building and during the visits which he is called upon to make as our official representative to Government Departments, Universities and other Institutions. (Hear, hear.)

During the first of my three years, Mr. Pilcher was without the help of our Assistant Secretary. It was a time of much stress, and he would, I know, wish me to speak of the great

assistance rendered to him by Miss Cawston, who never spared herself in doing practically double duty, and who continues, as chief clerk, to do excellent work in the same unstinting manner with a most liberal interpretation of her duties and of the hours to be spent in the service of the Institute. (Hear, hear.)

For nearly two years Mr. Marlow has acted as Assistant Secretary, and it is a matter for congratulation that in him we have a valuable officer who has shown that he can combine with secretarial duties others in which his scientific knowledge is of much value to the Institute. (Hear, hear.) We can congratulate him on having more than maintained the promise of success in his position which was evident a year ago.

In retiring from the office of President, it is a great satisfaction to me personally, as it is, I am sure, to all of you, that Mr. Alfred Chaston Chapman is to be your leader. (Hear, hear.) As a chemist in the full meaning of the word and as a professional man in the best sense of the term, he commands the confidence of all members of the Institute. (Hear, hear.) He is well known for his original work and his published scientific papers cover a wide field. He has had experience of our examinations both as a candidate and as an examiner. He has been a Member of Council for three full periods, and for several years he has been Chairman of the Public Appointments Committee. I congratulate the members on their choice of one who knows the Institute thoroughly, who has ever upheld its best traditions, and who has so often voiced its highest aspirations and ideals.

I have found it a great honour to be your President, and though I am relinquishing that office I hope I may yet work for the Institute and enjoy the privilege of serving under one who has been a valued friend for many years. (Cheers.)

I have much pleasure in moving that the Report of the Council for the year ending March 1st, 1921, be received and adopted.

Report of the Conference.

FEBRUARY 28th, 1921.

A Conference of the Fellows and Associates was held at the Institute on February 28th, 1921, to discuss the question of the desirability of members adopting an uniform practice with respect to the style, the character of the type used, and the particulars given in the entries of their names in directories, diaries and similar publications. Twenty-four Fellows and Associates were present.

The President said that the Conference was called in order to give the members an opportunity to express their views, and to establish, if possible, a consensus of opinion upon a matter of some importance. As he was *ex officio* a Censor, he could not express an opinion upon matters upon which he might be called upon to adjudicate. He thought, however, that everyone present had heard it expressed that the policy of the Institute was to raise the status of the profession of chemistry, and to bring that profession to a position comparable with that of the professions of medicine and the law. No medical man, for example, could have entries in a directory in such type or arrangement as would draw special attention to his name compared with others, without being called to order. Chemists could not have it both ways: they could not be professional men in the same way as medical men and lawyers, and at the same time be free to do what was against the traditions and etiquette of the professions. Since these matters had not hitherto been definitely determined, it should be unnecessary to state that the proceedings would have no relation to any entry which might then be appearing in any publication, and a reasonable period would elapse in order to give members an opportunity to conform to the decisions arrived at, because it should be remembered that chemists in practice were frequently unaware of arrangements made by their secretaries or clerks.

Mr. Macnab said that, if it was desired to promote a high

sense of dignity in the profession, the members must follow the etiquette generally followed by other professions and avoid anything like advertising. It was well worth while foregoing any slight advantage that might be expected from advertising for the sake of keeping the profession on a high plane, and it would redound to the welfare and benefit of the members.

Mr. E. W. Voelcker, the Honorary Treasurer, expressed his conviction that it would be a very great mistake to countenance any form of advertising. It would be against the interests of the profession and the interests of the individual member, and in any case advertising was not likely to be profitable or to attract the class of work with which a professional man liked to deal. The professional man could only hope to attract practice by acquiring a reputation for good work.

Mr. A. J. Chapman concurred with Mr. Voelcker in the view that when a man became known by his work, that in itself was sufficient advertisement for him.

The President suggested that someone should act as "devil's advocate," because there were difficulties in connection with younger men who had not made their names and did not find it easy to establish themselves in practice.

Mr. C. H. Field thought that the Institute ought to give some idea to the members as to the means they should adopt of letting the public know that they were in practice as consulting and analytical chemists. It need not be done by electric light signs, but something should be done, and the Institute should help the junior member; not every member was on a pedestal.

The President suggested that the same difficulty arose with medical men when they began practice. He thought, however, that the difficulty which Mr. Field had brought forward ought to be realised. The profession had got very near to the position when the public realised that there was a true profession of chemistry whose members were prepared to refrain from doing things which other professions would not

allow. There was no question that blatant advertising was a serious matter.

Mr. R. L. Collett, while in agreement with the maintenance of a high standard of conduct in the profession, held that it differed from that of medicine and the law, in that most people were compelled to resort to a doctor or lawyer at some time or other. He referred to the fact that manufacturing firms and companies, with which occasionally Fellows of the Institute were associated, advertised their businesses.

The President pointed out that such Fellows did not advertise as professional men, intimating that no complaint would arise provided they observed the practice of the profession so far as professional work was concerned.

Mr. Collett said that he hoped that the Conference was not simply for the purpose of passing a pious resolution. He hoped that the Censors or Council would be able to act upon it.

Mr. Hawkins said that he understood that one of the partners of a well-known firm of druggists' sundriesmen was a medical man ; but, so long as his profession was not brought into the matter, there could be no objection to the firm advertising their business as much as they liked.

The President concurred, and added that it was very necessary, in order to promote the applications of science to industry, that scientific men should be directors in industry, and this could be done without the concern advertising that it engaged in professional practice.

Mr. Collett asked whether the Institute would take action in such case.

The Registrar said that if any member raised a complaint it would be a matter for the Censors to investigate.

Mr. Hawkins held that if any member of the Institute allowed his name to appear prominently amongst those of other members in a directory, it was really unprofessional. No barrister, doctor, or solicitor would be allowed to do such a thing in England, although perhaps in Overseas Dominions there was occasionally some difficulty in considering whether the same practice should obtain as in England.

The President reminded the members of the steady movement during recent years towards consolidating the profession through the influence of the Institute. He thought it was almost the psychological moment for making good all the promises that had been given to the public as to the Institute being a body of competent men whom the public should trust as professional men. The Institute was the members, and the members themselves must determine the ethics of the profession.

Mr. Hawkins pressed the view that, whether at home or abroad, there was only one standard to be adopted, and that anything of the nature of advertising was radically wrong. He felt that there was a tendency to take a less professional view in some places abroad, where he was not at all sure that a lower professional standard was not also taken in other professions.

Mr. Lee suggested that it would be wiser to allow Fellows resident in the Overseas Dominions to observe such a standard of professional etiquette as obtained in those parts; they did not much like being legislated for.

The President said that if the Meeting passed resolutions they would be submitted to the Council, and would be made known to the Fellows and Associates generally. If professional etiquette was to be promoted the members would be expected to observe it.

Mr. Field again pressed for an answer as to the means which young men should adopt to bring themselves before the public.

The President said that men in other professions brought themselves to the notice of the public on their merits and by their work.

Mr. Collett said he could not think of any man having become a famous consultant in a particular line by advertising.

The President replied that usually such men had read valuable papers at meetings of societies and had contributed to the advance of knowledge.

Mr. Macnab said that he would like to submit a motion

to the effect that the Institute should adopt a standard of professional etiquette as high as that of any other profession.

The Registrar suggested that the meeting was called to discuss a specific question, namely, whether the members should adopt an uniform practice with respect to the style, the character of the type used and the particulars given in the entries of their names in directories, diaries and similar publications, in accordance with the practice obtaining in medicine, the law and the higher professions. He noticed that qualified architects and chartered accountants did not have their names in larger type in the Post Office Directory.

Mr. Macnab moved, and Mr. Porritt seconded, "That in the opinion of this Conference it is desirable that Fellows and Associates adopt an uniform practice with respect to the style, the character of the type used, and the particulars given in the entries of their names in published directories."

Mr. Collett wished to propose the addition of the words "and hereby urges the Council to take strong disciplinary action against any Fellows transgressing."

The Registrar said that the Council could only act on the report of the Censors; the Censors had to investigate each complaint as it came before them. Since the Extraordinary General Meeting held on 27th April, 1893, the resolution then passed relating to professional conduct had strengthened the hands of the Censors, and in his opinion had established principles which had been generally accepted by the members.

The Hon. Treasurer said that if the resolution was passed, it would be open to any member of the Institute to complain to the Censors of any infringement of it.

Mr. Collett said that he would like to see the Council make a definite ruling on the matter.

The President said that the Council would report what the Conference had decided, and the procedure that would be followed in the event of a complaint would be in accordance with the By-Laws.

The Registrar said that the Council were advised that neither the Council nor the Censors should take the prime

move in any matter of the kind, because the Censors acted as judges first of all, and if the case was so unsatisfactory that a member was called upon to resign, it was only on his refusing to resign when called upon that the Council knew anything about it. The Council should not be prejudiced when the case comes before them.

Mr. Collett said that he would like to add to the resolution, "and that all Fellows and Associates are urged to bring cases to the notice of the Censors so that action may be taken under Rule 57." He did not want to stop short at a pious expression of opinion.

The President intimated that if the resolution was passed it would be an expression of opinion that should have the necessary effect, and he hoped that no complaints would arise.

Mr. Hawkins suggested that the Conference had been called simply to give the Censors and the Council the views of the members on the subject.

The Registrar suggested that it would meet Mr. Collett's point if the following words were added to Mr. Macnab's motion: "And that departure from this practice should be considered a discreditable practice within the meaning of Section 16 (3) of the Charter."

With the concurrence of Mr. Porritt, Mr. Macnab's motion was then amended, put to the Meeting, and unanimously carried. It was then put as a substantive motion and carried, as follows:

"That in the opinion of this Conference it is desirable that Fellows and Associates should adopt an uniform practice with respect to the style, the character of the type used, and the particulars given in the entries of their names in published directories, and that departure from this practice should be considered as unprofessional conduct within the meaning of the Charter, Section 16 (3) and By-Law 57."

The President said that the next point was to obtain the opinion of the meeting with regard to pocket books, guide books, timetables, diaries, etc. It was the custom in some of

those publications to put in very few names which might possibly give the persons whose names so appeared a singular advantage. A guide book, or diary, for instance, might indicate that there were only three or four consulting chemists in London, while a directory would show that there were many.

The Hon. Treasurer objected to the insertion of names of professional men in any publication of the kind indicated, other than a *bona fide* directory, and hoped that such insertion would be discountenanced. Any one who wanted to find a name for business purposes would not turn to a guide or to a diary, but to a recognised directory giving the names of all practitioners within the sphere covered by the directory.

Mr. Hawkins agreed that a directory should include the name of every practitioner: it was for the convenience of the general public. A diary or guide book was a different thing and he thought the Institute should go so far as to say that the insertion of any name in any list other than a recognised directory was derogatory to the profession. He moved:

“That in the opinion of this Conference the insertion of the names of Fellows or Associates in publications such as diaries, pocket books, guide books, timetables, constitutes an advertisement and is thereby held to be discreditable within the meaning of the Charter, Section 16 (3) and By-Law 57.”

Mr. A. J. Chapman seconded the motion, which was unanimously carried.

Mr. Hawkins thereupon suggested that in Kelly's Post Office Directory it would be desirable to indicate the professional chemists who were Fellows and Associates of the Institute in the same way as had been done in the case of accountants, architects, and others.

The Registrar said that he would see the proprietors on the matter.

The President hoped that what had been done that afternoon would be valuable to the profession and that the Fellows and Associates would be guided by the opinion which had been expressed by the Conference.

Extraordinary General Meeting.

The Extraordinary General Meeting called for Monday, 28th February, 1921, was adjourned owing to lack of a quorum until 7th March, 1921, when the meeting was duly held in accordance with By-Law 7 (2) and (3), Mr. William Macnab, C.B.E., Vice-President, in the chair.

The Meeting was called to determine and define the Districts in Great Britain and Ireland and in the British Dominions and Protectorates beyond the seas and in the Empire of India, the members in each of which Districts shall be entitled to elect one District Member of Council in accordance with the provisions of the new By-Laws of the Institute.

The Districts suggested in the notice convening the meeting were amended in accordance with the views communicated by various members, and the meeting agreed unanimously to the following Resolution:—That for the purpose of the election of District Members of Council the Districts shall for the present be defined as follows:—

- (i) Birmingham and Midlands, including the Counties of Hereford, Salop, Stafford, Worcester, Warwick, Derby, Nottingham, Leicester, Lincoln, Rutland and Northampton.
- (ii) Bristol and South-Western Counties, including the Counties of Gloucester, Wilts., Dorset, Somerset, Devon and Cornwall.
- (iii) Liverpool and North-West Coast, including the Counties of Flint, Westmoreland and Cumberland, and so much of the Counties of Chester and Lancaster as lies to the west of the line drawn through the centre of the postal districts of Wigan and Warrington; the towns of Wigan and Warrington and all towns on the line of which the greater portion of the postal district lies to the west of the line. The Isle of Man.

- (iv) London and South-Eastern Counties, including the Counties of Middlesex, Kent, Sussex, Surrey, Berks., Oxford, Buckingham, Hertford, Essex, Bedford, Cambridge, Suffolk, Norfolk, Huntingdon, Hants., with the Isle of Wight and the Channel Islands.
- (v) Manchester and District, including so much of the Counties of Lancaster and Chester as lies to the east of the line drawn through the postal districts of Wigan and Warrington as aforesaid.
- (vi) North-East Coast and Yorkshire, including the Counties of Northumberland, Durham and York.
- (vii) Edinburgh and East of Scotland, including the Counties of Nairn, Elgin, Banff, Aberdeen, Kincardine, Forfar, Perth, Fife, Kinross, Clackmannan, Stirling, Linlithgow, Edinburgh, Haddington, Berwick, Peebles, Selkirk and Roxburgh.
- (viii) Glasgow and West of Scotland, including the Counties of Caithness, Sutherland, Ross and Cromarty, Inverness, Argyll, Dumbarton, Renfrew, Lanark, Ayr, Wigtown, Kirkeudbright and Dumfries.
- (ix) Wales (excluding the County of Flint, *see* iii). The County of Monmouth.
- (x) Ireland.
- (xi) The Overseas Dominions, the Empire of India and abroad.

Proceedings of the Council.

Appointment of Committees.—The Council elected on March 1st held their first meeting on March 11th, when they appointed the Standing and Special Committees with their respective chairmen (*see* pp. 90-92).

The following changes have been made in order to simplify the organisation of the Institute's business :

- (1) The Finance and House Committees have been amalgamated.
- (2) The Lectures and Library Committee have been amalgamated.
- (3) The General Purposes Committee will consist of the whole Council meeting in Committee.
- (4) The Glass Research, the Research Chemicals, and the Reagents Committee have been amalgamated with the Special Purposes Committee which was recently appointed to deal with matters of public interest concerning the profession.

At the same meeting the Council authorised the publication of the Memorandum referred to on p. 133.

Conference.—The Resolutions passed at the Conference held on February 28th have been communicated to the Council and referred by them to the General Purposes Committee for consideration and report.

Registered Students.—The Council propose to take special steps to further the interests of Registered Students, by providing means for bringing them together for lectures, debates, and social intercourse. At the same time, the Council have also decided to watch the progress of the training of Registered Students, and to ask for periodical reports on their work from the Fellows who are preparing them for their profession.

Library.—The Library Committee have purchased some recent publications, which can be seen at the Institute (*see* p. 154).

Board of Examiners.—At their meeting held on February 25th the Council, in addition to ordinary business, appointed the Board of Examiners for the ensuing year (*see* p. 94).

Institutions.—The Northern Polytechnic Institute has been added, subject to conditions agreed upon between the authorities of the Polytechnic and the Council of the Institute, to the list of institutions recognised for the training of candidates for the examinations.

Coal Mines Regulations.—The Director of Health and Safety, Mines Department, has replied to the representations made by the Council of the Institute regarding the sampling and analysis of dust samples and oxygen stating that the Secretary for Mines has brought the views expressed by the Council to the attention of the Secretary of the Mining Association of Great Britain, who has promised to bring them under the notice of the members of his Association.

In the meantime, on the publication of the Journal, Part I., 1921, a prominent Fellow, who is directly interested in colliery work, protested that the action of the Council was at fault in requiring that the work which merely consisted in determining the moisture and residue after incineration according to methods prescribed in the official order should be performed by qualified analysts, and, further, that he was

recommending collieries to entrust the work to any intelligent lad who happened to be available.

The Public Appointments Committee of the Institute, who have had this matter under consideration, is strongly of opinion, however, that its views were justified since the importance of the work lies in its interpretation rather than in its actual performance. Moreover, the Committee holds that the action taken is supported by the following Orders recently issued by the Mines Department :—

(S.R.O. 200). In pursuance of No. 4 of the General Regulations made under the Coal Mines Act, 1911, and dated 30th July, 1920, the Board of Trade hereby prescribe that the following procedure shall be adopted for the purpose of determining the amount of combustible matter in samples of dust mixture which contain carbonates, in lieu of the procedure prescribed by paragraph (c) of the said regulations :—

1. A weighed quantity of the dried dust shall be heated to a temperature high enough to ensure complete decomposition of the carbonates, in an open vessel, until it no longer loses weight; and the percentage loss of weight shall be determined.

2. A weighed quantity of the dried dust shall be treated with dilute acid in a suitable apparatus and the percentage loss of weight due to the evolution of carbonic acid gas shall be determined.

3. The difference between the two percentage losses of weight so determined, shall be reckoned as the percentage of combustible matter for the purpose of the test.

(S.R.O. 201.) In pursuance of No. 4 of the General Regulations made under the Coal Mines Act, 1911, and dated 30th July, 1920, the Board of Trade hereby prescribe that the following procedure shall be adopted for the purpose of testing the composition of samples of dust mixture which contain such a high percentage of moisture that the mixture cannot be sieved in the manner prescribed by the said regulation :—

1. The samples collected shall be well mixed and a weighed quantity of the mixture shall be dried at 212° F. The weight lost shall be reckoned as moisture.

2. The dust so dried shall be treated in the manner prescribed by paragraph (b) of the said regulation and the percentage of combustible matter shall then be determined in the manner prescribed by paragraph (c) of the regulation.

In connection with the above, the attention of the Council has also been directed to the action of the Technical School Committee of a Yorkshire Borough in allowing colliery owners within the district to have monthly tests of representative

samples of the dust in mines carried out by the Mining Lecturer at the local Technical School at a fee of 2s. 6d. per test of each sample, the lecturer to receive two-thirds of the fee. The Council hold that it is not a function of Technical Schools to compete with private practitioners in matters of this kind, and they have represented their views to the Committee concerned.

New Food Bill.—On the cessation of the Ministry of Food at the end of March, the Council understand that the promotion of the new Food Bill, proposed by Mr. McCurdy, is likely to be entrusted to the Board of Trade, with whom the Council are now in communication on that matter.

Special Purposes Committee (1920-21).—The Special Purposes Committee, referred to in Part I. (p. 38) as the Special Advisory Committee, originally appointed on January 27th, has prepared a Memorandum on Fine Chemicals, Laboratory Glass and Porcelain, which is published in this Part and has been widely circulated. It is the earnest desire of the Council to do all in its power to ensure that members of the Institute shall be able to obtain their requirements of the above-mentioned materials and articles from home sources and also aid manufacturers in successfully meeting such requirements (p. 135).

Public Analyst, Brighton.—Notwithstanding the circulars issued by the Council, referred to in the previous Part, a few candidates applied for the post of public analyst for the County Borough of Brighton. A Fellow of the Institute has been appointed, and his appointment has been confirmed by the Ministry of Health.

Finsbury Technical College.—The Council have received a letter from the City and Guilds of London Institute, in answer to the representation signed by the Presidents of sixteen professional institutions urging the continuance of Finsbury Technical College.

The Honorary Secretaries of the City and Guilds Institute state that, in view of the importance of not depleting the existing provision for technical training, particularly in engineering, at the present time, the London County Council have decided to assist in the maintenance of the College for a period of five years by an annual grant of £10,000 (exclusive of equipment grants), and that in the meantime the future objective of the College will be fully considered. This assistance, however, is subject to the conditions ordinarily attached to the award of Block Grants to governing bodies of polytechnics so far as applicable, and also to the Board of Education recognising the expenditure falling on the Council as ranking for the 50 per cent. deficiency grant. The London County Council state that until such recognition has been secured they cannot make any arrangements for the actual payments of the grants. The Council of the City and Guilds Institute have accepted the proposal of the County Council, and now await the decision of the Board of Education as required by the County Council, on the question of recognition. The assistance from the County Council, however, will not, it is understood, at any rate for the present, go beyond the carrying on of the present work for a limited period of five years, and will not provide for any extension or development of the work in the meantime. It has been suggested, therefore, that possibly the Institutions who presented the petition, and who have expressed so high an appreciation of the work of the College, might be willing, if an opportunity should present itself, to co-operate with the City and Guilds Institute both by associating themselves with the work of the College and by rendering some financial assistance towards its development.

The letter has been referred to the Finance Committee for consideration.

Fine Chemicals, Laboratory Glass and Porcelain.

The Council of the Institute of Chemistry have had under consideration a number of important issues arising from and directly relevant to the work undertaken by the Institute during the war in connection with the production, in this country, of laboratory requirements, such as reagents, research chemicals, glass and porcelain.

The Council recognise that the political considerations underlying some of these issues are outside the scope of the activities of the Institute ; but they regard the retention of industries concerned with laboratory supplies as essential to the maintenance of a powerful chemical industry, upon which, in turn, the future of a great many other industries depends. Further, and this is the special concern of the Institute in this matter, it affects the prospects of present and future members of the profession of chemistry. The Council feel, therefore, that they are called upon to put before all users of laboratory materials certain definite facts, and certain conclusions which may be drawn from those facts.

With regard to the production of chemical reagents, it is generally known that before the war this industry in our country was very limited, and the custom prevailed of buying such substances very largely from abroad. The Council are, however, in a position to state that, notwithstanding the high cost of labour and plant and the difficulty of obtaining suitable scientific staff and operatives, a great advance has been made during the war, and since, by our manufacturers, and this has already enabled professional chemists to obtain practically the whole of the reagent chemicals necessary for their work. Many instances have proved that British manufacturers are capable of producing chemicals in a state of purity fully comparable with that of

pre-war supplies from abroad, and the Council feel that in this matter it is their duty to emphasise the importance of encouraging home production.

The production of any considerable number of chemicals for research purposes could not be undertaken during the war, but great progress has since been made, as is evident from published lists, to which additions are constantly being made. Although, in the time at the disposal of manufacturers, it has been impossible to prepare so large a number as that previously obtainable from Germany, there can be little doubt that, if encouraged, British manufacturers will be able to meet the requirements of research workers. The Council of the Institute are far from suggesting that chemists should be hampered for want of chemicals if they cannot be obtained in this country in sufficient quantity and of the right degree of purity. What they wish to emphasise is that users of chemicals should make themselves acquainted with what is available as the result of the very substantial progress made by British manufacturers. With a view to helping to spread this knowledge the Council have appointed a special Committee to deal with questions relating both to reagents and research chemicals and will be prepared to assist chemists to obtain any materials which they may need.

If our manufacturers were not prepared to produce and supply substances of high quality at reasonable prices, the Council would have no ground for pressing the matter, but at this critical time, when the industry can be either firmly established by encouragement or destroyed by discouragement, the Council consider it their duty to put clearly before the members of the Institute and all users of such chemicals the necessity of making themselves fully acquainted with all the circumstances and of considering the ultimate effect of failing now to aid in building up a stable chemical industry in this country.

In respect of glass apparatus, certain manufacturers have shown enterprise, ability and readiness to produce the articles required ; but it has become more and more clear that these

manufacturers are under the impression that the support which was promised to them during the war and to which they confidently looked forward has not been extended to them in a measure sufficient to render them hopeful of the stability of this part of their industry.

Acting on the advice of the Institute, with the concurrence of the Board of Trade, the Board of Education and the Department of Scientific and Industrial Research, these manufacturers are providing articles, such as beakers, flasks, etc., distinctly marked to indicate their origin ; but it is well-known that unmarked articles are also being offered for sale. The Council of the Institute are aware that many complaints are made with respect to the quality and quantity of laboratory glassware sold as of British origin, but, so far as they have been able to obtain evidence at present, the complaints regarding glass of recent manufacture, marked with the names of known makers, have been few in number.

The Institute, with the approval of the Departments above referred to, has recently issued a letter to a large number of users, urging them to purchase only laboratory glassware which bears the manufacturers' distinctive marks. This action has been taken in order to help both the users and manufacturers, since without these marks it is impossible to trace the source of any articles which may be the subject of complaint and to take steps to remedy the faults disclosed.

In repeating and emphasising this point, the Council of the Institute feel that, if *bona fide* British manufacturers who are prepared to guarantee their productions by their own marks do not receive proper encouragement, the opportunity of establishing firmly the British scientific glassware industry will be lost, and this at a time when through enterprise and research success in respect of manufacture and technique has been attained. Indeed, British-made scientific glassware, equal at least in quality to any hitherto obtainable elsewhere, is forthcoming and at a price which is not unreasonable in the present circumstances, having regard to the high cost of materials and production. There is a prospect, moreover,

that when once the confidence of the manufacturers is restored and the industry established firmly, prices will compare favourably with those of articles now imported.

The same general considerations apply to the desirability of affording manufacturers of British laboratory porcelain such support as will enable them to complete the final stages of development necessary in order to supply porcelain of at least as high quality as that obtained from abroad.

The Council of the Institute are fully cognisant of the importance of not handicapping chemists by asking them to purchase articles so inferior in quality as to render their work more difficult or less satisfactory, and it is clearly recognised that any essential article which cannot be produced in this country of suitable quality and at a reasonable price must be obtained elsewhere. The Council feel, however, that many of the complaints which have been made relate to apparatus of doubtful origin and, for that reason, have appointed a Committee which is prepared, in the interests alike of users and manufacturers, to investigate any complaints which may be brought to their notice.

To summarise, the Council of the Institute earnestly desire to do all in their power to ensure that chemists shall be able to obtain their professional requirements from home sources, and to aid manufacturers in meeting successfully such requirements.

The greater recognition, during the war, of the importance of professional chemistry not only led to the rapid absorption in industry of the trained chemists then available, but had the effect of inducing a large number of ex-Service men and others to enter upon a course of training with the intention of adopting chemistry as a profession. This affords, in the opinion of the Council, additional reason for making every possible effort to foster chemical industry in this country, and so to create a greater demand for the services of all such properly trained and qualified men.

Local Sections.

Edinburgh and East of Scotland.—A meeting of the Section was held at Dowell's Rooms, Edinburgh, on February 8th, Dr. Leonard Dobbin, Chairman of the Section, presiding.

Dr. Dobbin, in an address, commented upon the fact that the Institute had just adopted a new set of By-Laws which might be destined to mark a turning point in its history. He suggested that the Institute should aim at strengthening its position by making persistent efforts to induce all who were qualified for admission to its membership to join, as well as by urging upon the younger generation of students of chemistry the importance of keeping prospective membership constantly in view. Referring to the anomalous position of the term "chemist," he suggested, as lines upon which legislation should be sought, that in the future, persons qualifying under the Pharmacy Acts as compounders and vendors of poisons should have the statutory title of "pharmacist" or "druggist" conferred upon them, while the name "chemist" should be the statutory title of members of the Institute. He further suggested that after a date to be fixed, limited companies, firms, whose partners were not members of the Institute, &c., at present trading as "chemists and druggists," or "pharmaceutical chemists," should be required to relinquish any title including the word "chemist" or "chemists" and to adopt the title "pharmacists" or "druggists," while similar provisions should apply, under like circumstances, to "manufacturing chemists," "wholesale chemists," &c., who could designate themselves "chemical manufacturers" or "wholesale chemical dealers."

Mr. S. C. Farrar, read a paper on "The Institute as a Professional Association," in the course of which he commented on the probable effect of the "Peterson Judgment" in relation to the activities of chartered bodies like the Institute. A discussion followed the reading of the

paper, to which Dr. T. W. Drinkwater, and Messrs, J. A. Watson, R. Bruce, and W. G. Martin contributed.

Attention is drawn to the fact that the proceedings of the Section are reported in the *Scotsman*. The Hon. Secretary suggests that all Sections should secure the support of the Press in thus bringing the profession of chemistry and the work of the Institute to the public notice.

London and South-Eastern Counties' Section.—

On February 16th, at the Institute, the Section held an informal meeting combined with an exhibition.

Mr. Norman Evers demonstrated the efficiency and utility of certain British-made indicators.

Mr. C. L. L. Claremont showed some interesting exhibits connected with the problem of rat extermination.

Mr. G. Burnand, on behalf of Messrs. Johnson, Matthey & Co., Ltd., exhibited a collection of rare and precious metals and their salts. Fine chemicals were shown by Messrs. Chemicals & By-Products, Ltd., and, through the kind offices of the Association of British Chemical Manufacturers, by Messrs. The British Drug Houses, Ltd., The Graesser Monsanto Chemical Works, Ltd., Boots Pure Drug Co., Ltd., and The Gas Light & Coke Co., Ltd. Chemical literature was displayed by Messrs. A. & F. Denny, H. K. Lewis & Co., Ltd., and Kegan, Paul, Trench, Trubner & Co.

Chemical glassware and porcelain were exhibited by members of the British Chemical Ware Manufacturers' Association, including Messrs. Duroglass, Ltd., John Moncrieff, Ltd., The Royal Worcester Porcelain Co., Ltd., and Wood Bros. Glass Co., Ltd. The Scientific Glass-blowing Company showed apparatus of their own manufacture; an expert representative of the Company gave a practical demonstration, and made many pieces of apparatus during the evening.

The Section held its Second Annual Dinner at the Imperial Hotel, Russell Square, on Wednesday, March 16th, Mr. Patrick

H. Kirkaldy presiding. The guests included Mr. A. Chaston Chapman (President of the Institute), Sir Frank Heath, K.C.B. (Secretary of the Department of Scientific and Industrial Research), the Registrar of the Institute and Mrs. Pilcher.

The toast of "The King" having been honoured, Sir Frank Heath proposed "The Institute and the President; The Section and the Chairman." Sir Frank expressed his appreciation of the work of the Institute and referred to its cordial relations with his Department. He reminded the members of the investigations in which the Department and the Institute had been mutually interested. The Department knew that it could look to the Institute for consultation and advice on matters concerning chemists, and was glad to avail itself of the existence of such a useful public body.

The President, in returning thanks, remarked that although he was an ordinary member of the Section, he was proud to be present in the capacity of President of the Institute. He thought chemists were coming more and more into their own; they were fast becoming a strong consolidated profession; and provided they held together for the common good, they could not fail to secure for chemistry the same measure of public recognition as was accorded to the older professions.

The Chairman, in reply, dealt briefly with the work of the London Section, claiming that suggestions which had been transmitted by the Section to the Council had led up to important developments. He expressed his great regret that Mr. Collett, the Hon. Secretary of the Section, was unable to attend through illness. The recent success of the Section was very largely due to Mr. Collett, but he had also to acknowledge the valuable services of Mr. Marlow, the Assistant Secretary of the Institute, who was also a member of the Committee of the Section, and the help very kindly given by Miss Cawston, the Chief Clerk of the Institute.

Sir Robert Robertson proposed the toast of "The Guests," to which the Registrar replied; and Mr. Arthur J. Chapman proposed "The Ladies," for whom Miss E. M. Chatt responded.

A programme of music was contributed by Miss Hilda Bertram, Miss Collett, Miss Watt, and Mr. Harmsworth. At the conclusion Mr. William Macnab proposed "The Chairman," the toast being received with musical honours.

Mr. Kirkaldy, in returning thanks, acknowledged the kind help of the artists who had so largely ensured the success and enjoyment of the evening.

Liverpool and North-Western Counties.—At a meeting of this section held on February 10th, Prof. W. H. Roberts, the chairman, submitted a paper dealing with some of the difficulties, particularly with reference to works chemists, which would arise if an attempt were made to close the profession of chemistry.

He referred to the Medical Act, 1858, which provided for the registration of unqualified practitioners, and mentioned that public analytical appointments had been virtually restricted to candidates holding specific qualifications, suggesting that it would not be difficult to include consulting and research chemists, chemists holding university and technical college appointments and chemists engaged in any key industry or in works producing foodstuffs or explosives.

It was felt, however, that this would not be sufficient, as the great body of works chemists were outside the foregoing categories, and it was absolutely essential for the well-being of the country that it should possess a large body of well educated and highly trained chemists, and also a second body of trained and skilled laboratory assistants. These bodies being analogous to the registered medical practitioners and nurses respectively.

In view of the fact that during the next 18 months many hundreds of trained chemists will issue from the universities, it was suggested that the time had come to make an effort to close the profession and regulate the education and training of chemists on the one hand and laboratory assistants on the other.

To achieve this end it was suggested :—

1. That the title “ Chemist ” should be rigidly and legally redefined.

2. That the profession should comprise two classes, chemists and laboratory assistants.

3. That the Institute of Chemistry should be the registration authority.

4. That a council consisting of members of the Institute, the universities, technical colleges, and Society of Public Analysts should be given powers, on similar lines to those of the General Medical Council, to regulate the education and training of chemists and laboratory assistants. The first duty of this body to be to determine to which class an applicant for admission to the profession belonged.

5. That no laboratory assistant or untrained person over 21 years of age should be permitted to be employed to conduct chemical analyses unless he possessed a diploma obtained in accordance with the regulations made by the suggested Council.

6. That the utmost advantage should be taken of the new Education Act in order to enable laboratory assistants to obtain the necessary instruction.

Mr. H. J. Evans thanked the chairman for his exceedingly interesting paper. The members present no doubt recollected that the former paper on this subject was circulated among the other local sections with a request that they would discuss it and give us the benefit of their views. He had been struck by the reply from the South Wales section, which recommended that action be taken to close the profession as regards analytical and consulting chemists. That section, however, did not think it practicable to prevent the employment of unqualified persons in laboratories and works, and the speaker had with regret come to the same conclusion. Mr. Smetham had also once remarked that the profession bore a closer analogy to the legal than to the medical profession. Mr. Evans therefore suggested that action be taken to prevent anyone save a duly registered person from practising

as an analytical and consulting chemist, and that only persons so registered should be allowed to issue certificates, or give technical evidence in a court of law, and that no person other than one so registered or licensed should be allowed to charge or recover fees for work done or advice given. This would not, of course, prevent the employment of unqualified persons by large firms, but it is more than probable that no firm of any standing would employ, in any responsible chemical position, a persons who was not a duly registered chemist, because the certificates or opinions of any other person would be valueless. In this way two clearly defined classes of chemical workers would be evolved, *i.e.* the chemical practitioner, corresponding to the barrister or solicitor, and the laboratory assistant, corresponding to the solicitor's clerk.

Mr. Alfred Smetham said there would not be much difficulty in imposing a qualification, so far as analysts were concerned ; but he thought there would be in the case of chemists employed by manufacturers. He would make it illegal for an unqualified chemist to give evidence in any legal proceedings. If the profession were closed to works chemists it would be necessary to admit so many at the start that he thought no benefit would accrue to the profession for many years.

Mr. William Ramsay asked where the line would be drawn between a chemist and a chemical assistant ?

The Chairman thought that only qualified chemists ought to be employed in food factories and in dangerous trades. He would like to extend it to all key industries.

Mr. P. N. Williams said that after spending eight or nine hours in a laboratory it would be too much to expect an assistant to attend evening classes. It would be detrimental to his health, and, in his opinion, men trained in such a way rarely rose very far.

Prof. Bannister said that the number of chemists in analytical practice was really very small, and few of these were unqualified. He suggested that it might be made illegal to use a certificate signed by an unregistered person for any

purpose whatever. The practice of taking premium apprentices and binding them for a number of years was disappearing. He thought that when apprentices or assistants were engaged, they should be required to show evidence of a good education, and they should be encouraged to take a matriculation examination before starting. They should be made to understand that unless they made a determined effort to become chemists they would not be retained. He did not agree that two or three evenings a week for classes would do any harm to anyone, and knew many people who had been very successfully trained in this way.

Mr. Watson Gray, referring to the recovery of fees by un-registered chemists, said that many practitioners would not care whether the fees were paid or not; if a client did not pay, the chemist was well advised to have nothing further to do with him. It had been suggested by a professor that there should be an F.I.C. at the head of every important works, but he (Mr. Gray) knew of one particular article made in various works, in which not a single F.I.C. was employed in any one of them. It was one of the most important products in the world. He thought the chance of closing the profession was worse than it had ever been; there were too many teachers, who would never become consulting chemists, and he thought they ought not to be in the Institute.

Dr. Brislee disagreed *in toto* with Mr. Gray's remarks. The teachers supplied the prospective chemists, and imparted to their students the Institute ideals. He thought it essential that they should be in the Institute. The principal difficulty he foresaw was in fixing the preliminary education of assistants.

Mr. Croad asked if the Government system of granting money for research was to be a general practice; if so, he thought it afforded a chance of insisting upon the employment of Institute men. It was public money, and it must be shown that it was properly expended.

Mr. Gabriel Jones asked if it was not likely that more than one association might exist, as in the case of the accountants and dentists; there were, for example, the Chartered Accountants and the Incorporated Accountants.

Mr. Evans thought that if a qualification were enforced, reputable people would only employ qualified chemists.

Prof. Bannister suggested that certificates would have no value unless signed by registered chemists ; this should not only hold in legal cases, but also in buying and selling.

The Chairman said that any proposals must come from the Institute, and provision must be made for those who would not be admitted. It was, of course, a question whether the Institute was the right body to deal with this matter, and whether it could act as an examining body and a registering body at the same time. Perhaps the better plan would be for the matter to be referred to a Committee composed of representatives of the universities, the Institute, Society of Chemical Industry, and Society of Public Analysts, called together by the Government.

Mr. Watson Gray suggested that manufacturers would not be dictated to ; they would take the risk that the analyses of their chemists were correct.

Mr. Knowles suggested a possible working arrangement between the Institute and the B.A.C., and Mr. Gabriel Jones supported this, remarking that it was impossible to get much information about the B.A.C., or to attempt to guide its policy, if the Institute ignored its existence.

Mr. P. H. Jones gave particulars of the policy and methods adopted by the Pharmaceutical Society, which imposed a four years' apprenticeship, following an approved preliminary examination, and followed by two years in an approved School of Pharmacy. The Society was endeavouring to arrange that all pharmacists should have a university training, and they had appointed someone to supervise the training classes. All chemists should have at least as good a training as pharmacists, the ground work was required as well as practical experience in the laboratory. He instanced the medical practitioner, who had to go through a long course of training in various subjects, but the average person would not care to rely upon him until he had had actual experience. He thought that when boys were engaged as laboratory

assistants, they should be told at the commencement what lay before them, and that they must pass examinations later or their services would not be retained. This was the practice in pharmacy.

Mr. R. B. Croad proposed that a resolution should be sent to the Council, and it was agreed that this should be done at the next meeting.

Manchester and District.—At a general meeting of the Section held on March 2nd, the members during the proceedings expressed the hope that information would soon be available on the progress made by the Legal and Parliamentary Committee in the investigation of the subject of chemists' agreements.

The Hon. Secretary of the Section recently attended a conference of representatives of Scientific Societies in Manchester, whereat arrangements were made to avoid overlapping in fixing dates of meetings and to co-operate in matters of mutual interest. The Hon. Secretary will be glad to hear from any member in the District who has not received an invitation to join the Section.

South Wales Section.—On January 7th a meeting of the Section was held jointly with the South Wales Section of the Society of Chemical Industry, when an interesting paper on "Coal" was read by Mr. C. A. Seyler, followed by a discussion, in which Messrs. H. J. Bailey, A. Grounds, F. J. Bloomer and Prof. J. E. Coates took part.

On March 19th, Mr. J. W. Adye submitted a paper on "The Contact Process for the Manufacture of Sulphuric Acid," describing some of the difficulties which had to be overcome in developing the Grillo process during the war.

Irish Section.—At a meeting of the Section held on Wednesday, January 19th, at the Royal College of Science for Ireland, Mr. Alfons O'Farrelly, in opening a discussion on "The Status of the Chemist," said that chemistry had become a definite profession offering a career to its devotees,

and that it was important that chemists should make that career attractive in respect of remuneration. The work of the chemist differed from that of the doctor or lawyer in that in most cases it involved no direct personal contact with the public. The war, however, had brought about a great improvement in the position of the chemist; his place in the community had been well advertised, and the time had come to take advantage of this public recognition. Mr. O'Farrelly indicated some salient points in the rise of the profession, among which were the foundation of the Chemical Society in 1841, the Institute of Chemistry in 1877, and of other associations more recently. The trend of each of these bodies was dwelt upon. He classified chemists as professional and industrial, sub-dividing the latter class into (*a*) a small branch acting individually as consultants, and (*b*) a large branch employed in works, forming an important part of a highly organised industrial system. As to the means of effecting an improvement in remuneration, he emphasised the value of individual effort and discussed the advantages and disadvantages of the formation of a trades union. The question had arisen in three stages: first, the development of the science of chemistry, fostered by societies such as the Chemical Society; second, the development of the profession of chemistry, fostered by the Institute, whose aim was to ensure that the exponents of the subject were properly qualified; and, third, the necessity which arose for ensuring the adequate remuneration of those exponents, for which purpose several associations had recently sprung into existence. He thought a union would arise or be developed from present organisations for the specific purpose of improving the remuneration of industrial chemists, and urged that a fair and impartial statement of the situation should be issued by some representative body such as the Institute.

In the discussion, Prof. Adeney remarked that the provisional protection of key industries would lead to increased demand for trained chemists, a matter of considerable importance, considering the large number of

young men at present undergoing training. Prof. Werner, while expressing the opinion that, until legal status was given to their profession, chemists must necessarily occupy an inferior position to members of the closed professions, commented on the circumstance that those who entered the profession of chemistry did so rather from the love of the subject than from pecuniary motives. Dr. Leonard reminded the students present that chemists entering industrial works must be prepared to justify their worth to their employers, and Mr. Andrews referred to the great debt which industry owed to pure science, and urged the importance of work chemists being thoroughly trained in physics and physical chemistry.

At a meeting of the Section held on Tuesday, 1st February, Prof. Werner gave an interesting paper on the constitution of urea. From the behaviour of urea on hydrolysis and when treated with nitrous acid under suitable conditions it was shown that the carbamide formula was not in keeping with the facts. The cyclic formula suggested by the lecturer, however, was shown to give a simple explanation of the chemical properties of urea and to be in agreement with the results of experiment. The lecture was illustrated by a number of experiments which clearly proved certain essential points in the line of reasoning followed by Prof. Werner.

At a meeting held on March 1st a vote of condolence with the relatives of the late Sir Charles Cameron was passed in silence, the members standing :—

The members of the Irish Section of the Institute of Chemistry of Great Britain and Ireland have heard with deep regret of the death of Sir Charles Cameron, C.B., M.D., F.I.C., who was one of the earliest members of the Institute, and acted as a member of Committee of the Irish Section since its inception. The Fellows and Associates desire to place on record their high appreciation of his work in Science and Public Health, and to express their sincere sympathy with the members of his family in their sad bereavement.

Mr. Douglas Mellon submitted an address on "The Works Chemist." He compared the nature of chemical control in large and small concerns; in the former it consisted of a number of highly organised sectional laboratories in which

routine chemical work is carried out by unqualified assistants under the supervision of one or more chemists, whereas in the latter a chemist often worked single-handed or with the minimum of assistance. Analytical work alone was rather a "blind alley" from the monetary point of view, and the young chemist would be well advised to acquire an intimate knowledge of manufacturing processes in order that he might be prepared to take control of a process when the opportunity arose.

The chemist in charge of processes must be possessed of caution and tact, so as to win the foreman to his side and keep him there. Chances of gaining knowledge of the processes and the business side of works were greater in a small concern than in a large one, and consequently the chemist often profited by beginning in a small concern. With regard to analytical control, volumetric methods were employed when available, as, although possibly not the most accurate, they were rapid and, provided the results were consistent and stood in a known ratio to those obtained by the most exact methods, they were quite satisfactory. The ratio, however might vary according to variation in the materials under examination, and caution must be exercised in such cases. Mr. Mellon mentioned some salient features in considering the lay-out of a works, and dwelt in some detail on the economic conditions necessary to justify the installation of plant in order to replace labour. In connection with the planning of works he referred his audience to a valuable publication of the Ministry of Munitions—Preliminary Studies for H.M. Factory, Gretna—which showed lucidly and comprehensively the studies and calculations which had to be considered in planning a factory.

Personal.

The Council record with deep regret the death of Prof. William Odling, F.R.S., Past President.

The Longstaff Medal of the Chemical Society has been awarded to Prof. Jocelyn Field Thorpe, C.B.E., F.R.S.

Major Paul Murphy has been appointed Director of Experiments, and Major W. C. Ball, Superintendent of the Chemical Department, at the Experimental Station, Porton.

Dye Licences Advisory Committee.—The President of the Board of Trade has appointed the following Committee to advise the Board of Trade with respect to the granting of licences under the Dyestuffs (Import Regulation) Act, 1920 :—

Mr. V. Clay (joint managing director, Robert Clay, Limited) Mr. G. W. Currie, Mr. G. Douglas (managing director, Bradford Dyers' Association, Limited), Mr. E. V. Evans, O.B.E., F.I.C. (treasurer of the Society of Chemical Industry), Dr. M. O. Forster, F.R.S., F.I.C. (director of the Salter Institute of Industrial Chemistry), Mr. C. C. Railton (director, Calico Printers' Association, Limited), Mr. H. B. Shackleton (Messrs. Taylor, Shackleton, and Co., Shipley), Mr. T. Taylor (Cornbrook Chemical Company, Stockport), Mr. S. A. H. Whetmore (British Dyestuffs Corporation, Limited), Mr. W. J. U. Woolcock, C.B.E., M.P. (general manager, Association of British Chemical Manufacturers).

Pending the appointment of a permanent chairman, which it is hoped to make at an early date, Mr. Percy Ashley, C.B., assistant secretary, Industries and Manufactures Department, Board of Trade, will act as chairman of the Committee. The Secretary to the Committee is Mr. W. Graham, M.B.E., and all applications for licences should be addressed to the Secretary, Dyestuffs Advisory Licensing Committee, Danlee Buildings, Spring-gardens, Manchester.

The Library.

Since the issue of the Journal and Proceedings for 1920, Part II., the Lectures and Library Committee has had much pleasure in acknowledging the following gifts:—

ATAK, F. W., M.Sc., F.I.C. :

The Chemists' Year Book. Edited by F. W. Atak, M.Sc., F.I.C., assisted by L. Whinyates, A.M.C.T., A.I.C. 2 Vols. *London*, 1920.

MESSRS. BAILLIERE, TINDALL & COX :

Silica and the Silicates. James A. Audley, B.Sc., F.I.C. *London*, 1921.

Anthracene and Anthraquinone. E. de Barry Barnett, B.Sc., F.I.C. *London*, 1921.

BARNETT, E. de Barry, B.Sc., F.I.C. :

Anthracene and Anthraquinone. E. de Barry Barnett, B.Sc., F.I.C. *London*, 1921.

THE CAMBRIDGE UNIVERSITY PRESS :

Technical Handbook of Oils, Fats and Waxes. Percival J. Fryer, F.I.C., and Frank E. Weston, B.Sc., F.I.C. 2 Vols. 3rd Edition. *Cambridge*, 1920.

MESSRS. CHAPMAN & HALL, LTD. :

Lubricating and Allied Oils. E. A. Evans. *London*, 1921.

Food Inspection and Analysis. Albert E. Leach. Revised and enlarged by Andrew L. Winton, Ph.D. 4th Edition. *London and New York*, 1921.

MESSRS. CROSBY LOCKWOOD & SON :

Animal and Vegetable Oils, Fats and Waxes: Their Manufacture, Refining, and Analysis, including the Manufacture of Candles, Margarine, and Butter. Geoffrey Martin, D.Sc., Ph.D., F.I.C. *London*, 1920.

DAVIES, L. J. :

South Wales Coals, their Analyses, Chemistry and Geology. L. J. Davies. *Cardiff*, 1920.

MESSRS. CHARLES GRIFFIN & CO., LTD. :

Centenary Volume, *London*, 1920.

HODGKINSON, W. R., C.B.E., Ph.D., F.I.C. :

One Thousand Experiments in Chemistry and the Useful Arts. Colin M'Kenzie. *London*, 1821.

JENNISON, F. H., F.I.C. :

Manufacture of Lake Pigments from Artificial Colours. F. H. Jennison, F.I.C. 2nd Revised Edition. *London*, 1920.

- KNAPP, A. W., B.Sc., F.I.C. :
Cocoa and Chocolate : Their History from Plantation to Consumer.
A. W. Knapp, B.Sc., F.I.C. *London*, 1920.
- MESSRS. LONGMANS, GREEN & Co. :
Cement. Bertram Blount, F.I.C., assisted by W. H. Woodcock
and H. J. Gillett. Monographs on Industrial Chemistry.
London, 1920.
- MESSRS. MACMILLAN & Co., LTD. :
Text-Book of Inorganic Chemistry for University Students.
J. R. Partington, M.B.E., D.Sc. *London*, 1921.
- MORGAN, J. J., F.I.C. :
Notes on Foundry Practice. J. J. Morgan, F.I.C. *London*, 1920.
- MESSRS. E. & F. N. SPON, LTD. :
Technical Chemist's Pocket Book. Robert Ensoll. *London*, 1921.
- STEWART, ALAN W., D.Sc., A.I.C. :
Guide Pratique du Chimiste Metallurgiste et de l'essayer. L.
Campredon. *Paris*, 1898.
- THORPE, PROF. J. F., C.B.E., F.R.S. :
Report of the (Indian) Chemical Services Committee, 1920.
Simla, 1920.
- TYLER, REGINALD, F.I.C. :
Dr. Sorby's Copy of Allen's Commercial Organic Analysis. 2nd
Edition. *London*, 1898.
- WALKER, A. JAMIESON, Ph.D., B.A., F.I.C. :
A Text-Book of Organic Chemistry. A. F. Holleman. Edited
by A. Jamieson Walker and O. E. Mott. 5th English Edition.
London and New York, 1920.
- WOODWARD, JAMES, B.A., B.Sc., F.I.C. :
The Principles of Chemistry. Mendeléeff. (5th Russian Edition,
1889).

Books Purchased.

- Alcohol : Its Production, Properties, Chemistry and Industrial Applications. Charles Simmonds, B.Sc., F.I.C. *London*, 1919.
- Beilstein's Handbuch der Organischen Chemie. Vierte Auflage. Bänder I.-III. *Berlin*, 1918-1920.
- Chemische Krystallographie. P. Groth. Vols. IV. and V. *Leipzig*, 1917-19.
- Determination of Hydrogen Ions. W. Mansfield Clark, M.A., Ph.D. *Baltimore*, 1920.
- Thorpe's Dictionary of Applied Chemistry. Revised and enlarged edition. Vol. I. *London*, 1921.
- Disinfection and the Preservation of Food. S. Rideal, D.Sc., F.I.C. *London and New York*, 1903.
- Examination of Water, Chemical and Bacteriological. William P. Mason. *London and New York*, 1917.
- Food Poisoning and Food Infections. W. G. Savage, B.Sc., M.D. D.P.H. *Cambridge*, 1920.

- Identification of Organic Compounds. The late G. B. Neave, M.A., D.Sc., and I. M. Heilbron, D.S.O., Ph.D., F.I.C. 2nd Edition. *London*, 1920.
- Introduction to the Chemistry of Plant Products. Vol. I. Paul Haas, D.Sc., Ph.D., and T. G. Hill, A.R.C.S. 3rd Edition. *London*, 1921.
- Introduction to Physical Chemistry. (Sir) James Walker, LL.D., D.Sc., F.R.S. 8th Edition. *London*, 1919.
- Introduction to Qualitative Chemical Analysis. Fresenius. Translated by C. A. Mitchell, M.A., F.I.C. 17th Edition. *London*, 1921.
- Laboratory Manual of Elementary Colloid Chemistry. Emil Hatschek. *London*, 1920.
- Manufacture of Intermediate Products for Dyes. J. C. Cain, D.Sc., F.I.C. 2nd Edition. *London*, 1919.
- Margarine. William Clayton, M.Sc. *London*, 1920.
- Metallic Alloys: Their Structure and Constitution. G. H. Gulliver, D.Sc. 4th Edition. *London*, 1921.
- Metals of the Rare Earths. J. F. Spencer, D.Sc., F.I.C. Monographs on Inorganic and Physical Chemistry. *London*, 1919.
- Mineral Industry: Its Statistics, Technology and Trade during 1918. Edited by G. A. Roush, A.B., M.S., and Allison Butts, A.B., B.S., Vol. XXVII. *London and New York*, 1919.
- Mineralogy of the Rarer Metals. Edward Cahen, A.R.C.S., F.I.C., and N. O. Wootton. 2nd Edition. *London*, 1920.
- Organic Chemistry for Advanced Students. Julius B. Cohen, Ph.D., B.Sc., F.R.S. 3 Vols. *London*, 1920.
- Practical Biological Chemistry. G. Bertrand and Pierre Thomas, translated by H. A. Colwell, M.B., D.P.H. *London*, 1920.
- Practical Physiological Chemistry. Sydney W. Cole, M.A. 6th Edition. *Cambridge*, 1920.
- Practical Physiological Chemistry. Philip B. Hawk, M.S., Ph.D. 6th Edition. *London*, 1919.
- Quantitative Analysis by Electrolysis. A. Classen. Revised, rearranged and enlarged by William T. Hall. *London and New York*, 1919.
- Rubber, Resins, Paints and Varnishes. R. S. Morrell, M.A., Ph.D., F.I.C., and A. de Waele, A.I.C. *London*, 1921.
- Solubilities of Inorganic and Organic Substances. A. Seidell, Ph.D. 2nd Edition. *London and New York*, 1920.
- Technical Methods of Ore Analysis. Arthur H. Low. *London and New York*, 1919.
- Text-Book of Inorganic Chemistry. J. A. Newton Friend, D.Sc., F.I.C. Vol. VIII. The Halogens and their Allies. Geoffrey Martin, D.Sc., F.I.C., and E. A. Dancaster, B.Sc., A.I.C. *London*, 1919.

The Lectures and Library Committee will be grateful to Fellows, Associates, Authors and Publishers for the continuance of their generous support.

The Committee will be glad to receive gifts of any of the following, which are needed to complete sets :—

<i>Publication.</i>	<i>Wanted.</i>
The Analyst	Vols. 3 and 4.
The Chemical News	Vol. 29, Nos. 748 and 754 ; Vol. 30, Nos. 766, 767 and 786.
The Chemical Trade Journal.	Vol. 27, No. 610.
Chemiker-Zeitung	Vols. 1-17, inclusive.
Chemisches Zentralblatt	The first four series, and Vol. 1 of the 5th series.
Comptes Rendus	From commencement to 1877, inclusive, and 1894 onwards.
Journal of the Board of Agriculture	From Vol. 2, Part 3, to Vol. 7, Part 3, inclusive.
Journal of the Institute of Brewing	1898 (Nos. for January and March) ; 1899 (No. for February).
Metallurgical and Chemical Engineering	Vols. 1-4 of the Metallographist, inclusive.
Proceedings of the Royal Society	Vols. 1-12 (1862), and Vol. 25 (1876) onwards.
Zeitschrift für angewandte Chemie	From commencement to 1898 inclusive ; and 1901.

Books and their Contents.

[Books marked * have been presented by the authors or publishers, and may be seen in the Library of the Institute.]

- “Ammonia and the Nitrides.” E. B. Maxted. Pp. vi. and 116. (London: J. & A. Churchill.) 7s. 6d.

Ammonia equilibrium; synthesis of ammonia; nitrides of the groups of the periodic system; active nitrogen.

- “Animal and Vegetable Fixed Oils, Fats, Butters and Waxes: their preparation and properties and the manufacture therefrom of candles, soaps and other products.” C. R. Alder Wright. Third edition, revised by C. Ainsworth Mitchell. Pp. xiii. and 939. (London: Charles Griffin & Co., Ltd.) 56s.

General composition and nature; physical properties; chemical properties; processes of extraction, rendering, refining, etc.; classification and uses; adulterations; the candle industry; the soap industry; appendices, containing references to reports issued by the Ministry of Food and a note on vitamins.

- * “Anthracene and Anthraquinone.” E. de Barry Barnett. Pp. x. and 436. (London: Bailliere, Tindall & Cox.) 27s. 6d. net.

Anthracene and its homologues; simple derivatives of anthracene; the anthraquinones and dianthraquinonyls; anthrone, anthranol and allied products; anthraquinone ring syntheses; the benzanthraquinones; aldehydes, ketones, and carboxylic acids; nitro, nitroso, and halogen anthraquinones; sulphonic acids, mercaptans and sulphides; aminoanthraquinones and dianthraquinonylamines; hydroxy and aminohydroxy anthraquinones and ethers; pyridine and quinoline derivatives; acridones, xanthenes, and thioxanthenes; benzanthrones; cyclic azines and hydroazines; miscellaneous heterocyclic compounds; miscellaneous compounds.

- “Artificial Silk and its Manufacture.” J. Foltzer. Translated from the French by T. Woodhouse. Pp. xi. and 244. (London: Sir Isaac Pitman & Sons, Ltd.) 21s.

- “Beilstein's Handbuch der Organischen Chemie.” Vierte Auflage. Band I.: System-nummer 1-151; Band II.: System-nummer 152-194; Band III.: System-nummer 195-322. (Berlin: Julius Springer.)

- “British Scientific Instruments, Dictionary of.” British Optical Instruments Manufacturers Association. Pp. xii. and 325. (London : Constable & Co., Ltd.) 21s.
- “Chemical Technology and Analysis of Oils, Fats and Waxes.” J. Lewkowitsch, edited by G. H. Warburton. Sixth Edition. Vol. I. Pp. xviii. and 682. (London : Macmillan & Co., Ltd.) 36s.
- “Cocoa and Chocolate : their Chemistry and Manufacture.” R. Whympers. Second Edition. Pp. xxi. and 568. 42s. History, botany and agriculture of cacao ; manufacture of chocolates and cocoa powders : chemistry of cacao.
- “Coke Oven and By-product Works Chemistry.” T. Bid-dulph Smith. Pp. 180. (London : Charles Griffin & Co., Ltd.) 21s.
Analysis, plant, calorimetry and polarimetry. Two Appendices.
- “Colloid Chemistry, Applied : General Theory.” Wilder D. Bancroft. Pp. viii. and 345. (London and New York : McGraw Hill Book Co., Inc.) 18s.
Adsorption of gas or vapour by solid, of vapour by liquid, and of liquid and solid by solid and liquid : adsorption from solution : surface tension ; coalescence ; preparation and properties of colloidal solutions : jellies and gelatinous precipitates ; emulsions and foams, fog and smoke.
- “Creative Chemistry.” E. E. Slosson. Pp. 311. (London : University of London Press.) 12s. 6d.
Description of recent achievements in the chemical industries.
- “Dairy Chemistry : Practical Handbooks for Dairy Chemists and others having Control of Dairies.” H. Droop Rich-mond. Third Edition. Pp. xii. and 490. (London : Charles Griffin & Co., Ltd.) 25s.
Part I : The constituents of milk ; Part II : the analysis of milk and milk products ; Part III : Technical applications.
- “Drugs and Medicines, Chemistry and Analysis of.” H. C. Fuller. Pp. xix. and 1072. New York : John Wiley & Sons, Inc. ; London : Chapman & Hall, Ltd.) 55s.
Part I : General methods and crude drug assays ; Part II : Alka-loidal drugs, alkaloids and medicinally allied substances ; Part III : Glucosides, glucosidal drugs and natural drugs containing principles other than alkaloids ; Part IV : Other organic substances ; Part V : Inorganic section.

"Dynamical Theory of Gases." J. H. Jeans. Third Edition. Pp. 449. (Cambridge: Cambridge University Press.) 30s.

Imperial Institute Monographs on Mineral Resources, with special reference to the British Empire: "Chromium Ore." W. G. Rumbold. Pp. 58. 3s. 6d. "Lead Ores." T. C. F. Hall. Pp. 127. 6s. (London: John Murray.)

"Industrial Scientific Research, The Organisation of." C. E. K. Mees. Pp. 171. (New York: McGraw Hill Book Co., Inc.) 12s.
Position, staff, building and equipment, direction, design.

"Mineralogy, Economic." Thomas Crook. Pp. xi. and 492. (London: Longmans, Green & Co.) 25s.
Crystals and their calorimetry: physical characters of minerals; crystal optics: chemical examination and physical analysis of minerals: economic classification: data of specific minerals.

"Monographs on Bio-Chemistry: Physiology of Protein Metabolism." Pp. vii. and 176. E. P. Cathcart. (London: Longmans, Green & Co.) 12s. 6d.
Digestion and absorption of protein; protein regeneration: feeding experiments: de-aminisation: protein requirements: influence of carbohydrates and fats on protein metabolism.

"Monographs of Inorganic and Physical Chemistry: The Electronic Conception of Valence and the Constitution of Benzene." Pp. xviii. and 300. H. Shipley Fry. (London: Longmans, Green & Co.) 16s.
The electronic conception of valence: electronic formula of benzene; substitution in the nucleus: physical properties and physico-chemical phenomena: molecular volumes: absorption of light and fluorescence. Metal amines.

*"Organic Chemistry, A Text-Book of." A. F. Holleman, translated by A. Jamieson Walker and O. E. Mott. Pp. xviii. and 642. Fifth English Edition. (New York: John Wiley & Sons, Inc.; London: Chapman & Hall, Ltd.) 19s.

Part I: Aliphatic compounds: Part II: Cyclic compounds (carbocyclic compounds: hetero-cyclic compounds).

"Tables of Physical and Chemical Constants," and some Mathematical Functions. G. W. C. Kaye and T. H. Laby. Fourth Edition. Pp. 161. (London: Longmans, Green & Co.) 14s.

"Plant Life, Chemistry of." R. W. Thatcher. Pp. xvi. and 268. (New York: McGraw Hill Book Co., Inc.) 18s.

Plant nutrients; organic components of plants; photo synthesis; carbohydrates: gums, pectins and celluloses; glucosides; tannins; pigments: organic acids; esters, fats; waxes; lipoides; essential oils and resins; vegetable bases; proteins; enzymes; physical chemistry of protoplasm.

"Poisons: their Effects and Detection." A. W. Blyth and M. W. Blyth. Fifth Edition. Pp. xxxiv. and 745. (London: Charles Griffin & Co., Ltd.) 36s.

Introductory and general; poisonous gases; acids and alkalies; more or less volatile poisonous substances capable of being separated by distillation from neutral or acid liquids; alkaloids and poisonous vegetable principles separated for the most part by alcoholic solvents; poisons derived from living or dead animal substances; oxalic acid group of poisons; inorganic poisons.

"Silica and the Silicates." J. A. Audley. Pp. xii. and 374. (London: Bailliere, Tindall & Cox.) 15s.

Silica; silicates; lime, cement, and mortar; ceramic industries; glass and enamels; miscellaneous applications of silicates.

"Synthetic Drugs, Chemistry of." Percy May. Pp. xiv. and 248. (Longmans, Green & Co.) 12s. 6d.

Third edition, including necessary alterations and additions in the light of the experience of the last two years.

A Committee of the British Science Guild has prepared a Catalogue of British Scientific and Technical Books, which is now in the hands of the printers. The Catalogue is an extension of the list of books which was given in the catalogue of the British Scientific Products Exhibition, 1919, held under the auspices of the Guild. In conjunction with the Institute's notes on Books and their Contents, the catalogue should be of service to chemists and firms who desire to extend their libraries, and especially to those who are forming the nucleus of a chemical library. A Prospectus can be obtained from the Guild Office, 6, John Street, Adelphi, London, W.C.2.

Obituary.

GEORGE ALEXANDER BYRN died at Sydney, New South Wales, on January 2nd, 1921, in his sixty-seventh year. Educated at the Diocesan Grammar School, Waterford, and at Cowley College, Oxford, he obtained his training in chemistry at Queen's College, Cork, where he also took the course in the Faculty of Engineering. He was for fifteen years Demonstrator in Chemistry at the Sydney Technical College, and for many years chief assistant to the late William A. Dixon, with whom he went into partnership in 1899. The firm (which also included Mr. A. J. Dixon, now the sole survivor) practised in Sydney as Assayers and as Analysts for the Municipal Council of Sydney, under the Public Health Act, New South Wales.

SIR CHARLES ALEXANDER CAMERON died on February 27th, 1921, in his ninety-first year. The son of Captain Ewen Cameron, of Lochaber, he was born in Dublin, where also he was educated and received his professional training in medicine and chemistry, taking the latter subject with Dr. Aldridge. At the foundation of the Institute he already held several appointments as a teacher of chemistry, and was Public Analyst for the City of Dublin. He was appointed chief Medical Officer of Health in 1880, and also held appointments as public analyst for many counties and boroughs in Ireland, and acted as medicine analyst for many Poor Law Unions.

He was a Fellow. Past President and Professor of Hygiene and Chemistry in the Royal College of Surgeons, Ireland, a Past President of the surgical section of the Academy of Medicine, Dublin, and a Past President of the Society of Public Analysts (1893-1894). In 1885 he received the honour of Knighthood, mainly for his services in the cause of public health, and in particular for reforms in the housing of the poor of Dublin, and in 1899 was appointed a Companion of the Bath in recognition of his long public services.

He was the author of text-books on the Chemistry of Agriculture (1857) and on Elementary Chemistry and Geology (1896-1898), and of several manuals on Hygiene, Food and Diet, in addition to a translation of German poems (1876), a History of the Royal College of Surgeons, Ireland, and of Irish Medical Institutions (1886), and a volume of Reminiscences (1913). He received the degree of M.D. (*Honoris causa*) from the Royal University of Ireland in 1896, and was elected an Honorary Fellow of the Royal College of Physicians, Ireland, in 1898.

He was elected a Fellow of the Institute in 1878, and was a Vice-President from 1884 to 1890.

WILLIAM ODLING died at Oxford on February 17th in his ninety-second year. The son of George Odling, surgeon, he was born at Southwark, and studied chemistry under Hofmann at the Royal College of Chemistry, and medicine at Guy's Hospital, graduating as M.B.(Lond.) in 1851. In that year he went to Paris to continue his training in chemistry under Gerhardt. On his return he was appointed demonstrator at Guy's Hospital, and in 1863, lecturer at St. Bartholomew's Hospital. In 1856 he became one of the Hon. Secretaries of



Sodine.

WILLIAM ODLING, M.A., M.B., F.R.S.
President : 1883—1888.

the Chemical Society, and from 1860 to 1872 was a frequent contributor to the Transactions, dealing with the determination of atomic weights, valency, the classification of the elements, and similar subjects. He was elected a Fellow of the Royal College of Physicians, and a Fellow of the Royal Society in 1859. From 1868 to 1873 he was Fullerian Professor at the Royal Institution, and in 1872 succeeded Sir Benjamin Brodie as Waynflete Professor of Chemistry at Oxford University, which position he held for forty years, retiring in 1912. He was President of the Chemical Society (1873-1874); was a Master of Arts in the University of Oxford, and a Fellow of Worcester College; and was awarded the Degree of Ph.D. in Mathematics and Physics in the University of Leyden in 1875. At the foundation of the Institute he was a member of the Organisation Committee, an Original Vice-President, and in 1883 was elected President, holding office for five years covering the period during which the Institute received recognition from the Crown by the grant of a Royal Charter. He was subsequently a Vice-President for a further period (1888-1891), and he served also as a Censor for 1878-1880 and 1882-1891. He was for many years one of the analysts for the London water supply, was a member of a Royal Commission on Beer Materials and in 1876 acted as British judge for chemical manufactures at the Exhibition at Philadelphia. His translation of Laurent's *Chemical Method; Notation, Classification, and Nomenclature*, was published by the Cavendish Society in 1855, and in 1857 he contributed a paper to the Philosophical Magazine *On the Natural Groupings of the Elements*, which may be regarded as leading up to the discoveries of Newlands and Mendeleeff. He was also the author of numerous papers and of several textbooks, including *A Manual of Chemistry: Descriptive and Theoretical* (1861), *Lectures on Animal Chemistry* (1866), *Outlines of Chemistry* (1869), *A Course of Six Lectures on Chemical Changes of Carbon* (1869), *A Course of Practical Chemistry* (1878), and *A Primer of Chemistry* (1882). His addresses to the Institute are indicative of his ready speech, which was fostered no doubt by his devotion to literature. He was also interested, as a collector of engravings, in the fine arts, and rendered useful service in that connection to the Ashmolean Museum and to the University Galleries.

He was buried at Holywell Cemetery on February 21st, when the Institute was represented by Dr. F. D. Chattaway, Past Vice-President.

HERBERT PORTER died on February 23rd at the age of 60 years. The son of John Henderson Porter, patentee of the Porter-Clark water-softening process, he was trained at the Royal School of Mines, London, and after about six years' association with his father, was for three years assistant to Francis Sutton, of Norwich. He then worked with Messrs. Burroughs, Wellcome & Co., at Dartford, for two years, and with the New Explosives Co., at Stowmarket, for three or four years. In 1895 he was appointed a Sub-Inspector under the Alkali, &c., Works Regulation Act, in charge of the Manchester District (South Lancashire and part of Yorkshire), and, in 1908, became Inspector for the Special District of Widnes, Runcorn and Liverpool.

He was elected a Fellow of the Institute in 1887.

Changes in the Register.

At the meetings of the Council held on January 21st, and February 25th, 1921, 5 Associates were elected to the Fellowship; 24 Associates were elected; and 51 Students were admitted.

The Institute has lost 9 Fellows by death.

Associates Elected to Fellowship.

- Drakeley, Thomas James, M.Sc. (Lond.), 68, Manchuria Road, Clapham Common, London, S.W. 11.
 Gibson, William Howieson, O.B.E., D.Sc. (Lond.), York Street Flax Spinning Co., Ltd., Belfast, Ireland.
 Reilly, Joseph, M.A., D.Sc. (R.U.I.), F.R.C.S.I., Royal Naval Cordite Factory, Holton Heath, nr. Wareham, Dorset.
 Rowe, Frederick Maurier, M.Sc. (Leeds), College of Technology, Manchester.
 Webb, Harry William, M.Sc. (Birm.), Technical College, Cardiff.

New Associates.

- Backes, Joseph John Valentine, A.R.C.S. (Lond.), Braemar, Harold Wood, Essex.
 Baker, Bertram Francis, 34, Chelmsford Road, Leytonstone, London, E. 11.
 Baylis, Miss Dorothy, B.Sc. (Liv.), 4, Sunnyside, Lightcliffe, nr. Halifax, Yorks.
 Blane, Edward Richardson, A.M.C.T., 10, Wright Street, Chorlton-on-Medlock, Manchester.
 Brown, Joseph Patrick, B.Sc. (Vict.), Brackley Villa, Little Hulton, Bolton, Lancs.
 Cadman, William Henry, B.Sc. (Wales), Agricultural College, Giza, Egypt.
 Clayton, Herbert, B.A. (Oxon), 75, Thornbury Drive, Bradford, Yorks.
 Facer, Albert William, B.A. (Oxon), Agricultural Laboratory, Box 387, Salisbury, S. Rhodesia.
 Farnell, Robin George Westbury, A.R.C.S. (Lond.), Rector's Lodge, Exeter College, Oxford.
 Gentle, Joseph Alfred Hector Roberts, B.Sc. (Lond.), 21, Owenite Street, Abbey Wood, London, [S.E.]
 Harris, Ellis Thomas, B.A. (Cantab.), 19, Hawthorn Terrace, New Earswick, York.
 Jones, Richard Morgan, M.Sc. (Liv.), 37, Fell Street, Kensington, Liverpool.

- Mann, Miss Gladys Ruby, B.Sc. (Lond.), Ianthe, 27, Lansdowne Road, S. Woodford, Essex.
- Nickolls, Lewis Charles, B.Sc., A.R.C.S. (Lond.), Imperial College of Science and Technology, S. Kensington, London, S.W. 7.
- O'Toole, Peter Keily, M.Sc. (Dub.), 17, Catherine Street, Waterford, Ireland.
- Phillips, Henry B.Sc. (Lond.), 37, Henry Street, Upper Kennington Lane, Vauxhall, London, S.E. 11.
- Plowman, Arthur, B.Sc., A.R.C.S. (Lond.), 8, Rowantree Road, Bycullah Park, Enfield.
- Powell, Walter James, B.Sc., A.R.C.S. (Lond.), Royal College of Science, South Kensington, London, S.W. 7.
- Rogers, Cecil William, B.Sc. (Lond.), 62, Hartington Road, Preston, Lancs.
- Sayer, Harold Charles, A.C.G.I., 3, King Edward Avenue, Dartford, Kent.
- Shorrocks, James Norman, B.Sc.Tech. (Mane.), Beech Mount, Winnington, Northwich, Cheshire.
- Thorne, Emmanuel Isaac, 13, Cantwell Road, Woolwich, London, S.E. 18.
- Williams, Aneurin, M.Sc. (Liv.), 57, Frederick Street, Widnes, Lancs.
- Wood, Cyril Christian, B.Sc., A.R.C.S. (Lond.), 94, Park Avenue South, Crouch End, London, N. 8.

New Students.

- Austin, Reginald George, 23, Exmoor Road, Southampton.
- Baskett, Ronald Gilbert, 121, London Road, Reading
- Bell, Herbert Vincent, Sceneliff, Redcar Road, South Bank, Yorks.
- Benson, Gwyn, Maesyffynon, Merthyr Road, Pontypridd, Glam.
- Bowden, Sydney Thomas, The Emporium, Seven Sisters, Glam.
- Calvert, Harry Shaw, Wagaraw, Greenhead Road, Huddersfield.
- Clothier, George Leonard, 28, Grove Road, Surbiton, Surrey.
- Comrie, Alan Arthur Douglas, Flat E, 15, Vera Road, Fulham, London, S.W. 6.
- Dawson, Thomas Theodore, 17, Upper Grosvenor Road, Handsworth, Birmingham.
- Elder, Henry, 20, Warrender Park Road, Edinburgh.
- Exell, Harold Cyril, 41, Cantley Avenue, Clapham Common, London, S.W. 4.
- Fairley, Henry, 6, Faraday Place, Addiewell, Midlothian, Scotland.
- Fleming, James Sinton Bruce, 47, Montpelier Park, Edinburgh.
- Flett, Thomas, Anchor Cottage, Kirkwall, Orkney.
- Gibbon, Eric Rupert, Spring Bank, Whitefield Road, Ashton-on-Mersey, nr. Manchester.
- Goldthorpe, Harold Hopwood, Shelley, nr. Huddersfield, Yorks.
- Green, Frank Joseph, 35, Botha Road, Plaistow, London, E. 13.
- Harris, John Sargent, 20, Essex Road, Rushden, Northants.
- Hart, Edward Holford, 35, Park Avenue, Cricklewood, London, N.W. 2.
- Harvey, Sidney John, Bridge Cottage, Leatherhead.
- Hole, Stanley Reginald, 10, Ringstead Road, Catford, London, S.E. 6.

Horton, Harold Vivian, 9, Brambledown Road, Wallington, Surrey.
 Ling, Arthur William, 15, Howard Road, Penge, London, S.E. 20.
 Llewellyn, Herbert Mervyn, 35, Northfield, Bridgwater, Somerset.
 Mathie, John Richardson, Roseneath, 14, Eglinton Place, Saltcoats,
 Ayrshire.

McDonald, Hector Archibald, Cultbent, Linlithgow.

McMillan, Walter Keith, Ashley, Market Harborough, Northants.

Murch, William Owen, 25 Wix's Lane, Clapham Common, London, S.W. 4.

North, Charles William, Leacroft, Stanwell Road, Ashford, Middlesex.

Palfreeman, Geoffrey, Pleasley, Mansfield, Notts.

Payne, John William, Nazeing Park Gardens, Waltham Cross, Essex.

Potter, Victor James, 34, Clifton Road, Kingston Hill, Surrey.

Pound, Albert, 81, Hoopen Street, Holwell Road, Exeter.

Press, Edwin William Stanley, 156, Brigstock Road, Thornton Heath,
 Surrey.

Reid, John, St. Helens, Albert Terrace, Musselburgh, Scotland.

Sayce, Leonard Alfred, 5, Toward Terrace, Sunderland.

Stephenson, Henry, Walton Mount, Walton, nr. Wakefield, Yorks.

Storey, Ralph Charles, 119, Moorside, Armley, Leeds.

Thatcher, Alfred Ronald, 94, Brecknock Road, London, N. 7.

Tritton, Frederic Jenner, 1 F. Vicarage Mansions, West Green, London,
 N. 15.

Tunstall, Richard Brian, 16, College Road, Saltley, Birmingham.

Umanski, Arthur Joseph Victor, 71, Staverton Road, Brondesbury
 Park, London, N.W. 2.

Urquhart, Alexander Robert, 106, Marchmont Road, Edinburgh.

Walker, Ernest, 6, Wellington Street, Waterloo, nr. Liverpool.

Walker, Thomas, 151, Stockwell Park Road, London, S.W. 9.

Wayne, Edward Johnson, 20, Cowper Street, Leeds.

Webster, David Mackay, 17, Watson Street, Falkirk, Scotland.

Weingott, Hyam, 11, Ashbrooke Terrace, Bebington, Cheshire.

Weston, Frank Ramsay, 29, Sibella Road, Clapham, London, S.W. 4.

White, Colin McLuckie, 16, Hopetoun Place, Winchburgh, West
 Lothian, Scotland.

Woodroffe, Frank Windham, 43, Mexborough Street, Chapeltown
 Road, Leeds.

DEATHS.

Bertram Blount.

Alexander Wynter Blyth, M.R.C.S., L.S.A., Barrister-at-Law.

George Alexander Byrn.

Sir Charles Alexander Cameron, C.B., M.D.

Herbert Yabsley Loram.

Prof. William Odling, M.A., M.B., F.R.S.

Herbert Porter.

Isaac Sydney Scarf.

Changes of Name.

Miss Louie Midgeley Badger (Associate)—on her marriage, Mrs. Sinnatt

Miss Elizabeth Gentle Kennedy (Associate)—on her marriage, Mrs.
 Raikes.

General Notices.

Examinations.—The Council give notice that Examinations will commence on July 4th. The list of candidates will be closed on Monday, 30th May, 1921.

Candidates who intend to present themselves can obtain further information from the Registrar.

Notice to Associates.—Associates elected prior to April, 1918, who can produce evidence satisfactory to the Council that they have been continuously engaged in the study and practical applications of chemistry for at least three years since their election to the Associateship, can obtain from the Registrar particulars of the Regulations and forms of application for election to the Fellowship.

Appointments Register.—A Register of Fellows and Associates of the Institute of Chemistry who are available for appointments is kept at the Offices of the Institute. For full information, inquiries should be addressed to the Registrar.

Fellows and Associates are invited to notify the Institute of suitable vacancies for qualified chemists.

Registered Students in the last term of their college course may receive the Appointments Register of the Institute on the same terms as Fellows and Associates, provided that their applications for this privilege be endorsed by their Professor.

The Institute also maintains a Register of Laboratory Assistants who have passed approved Preliminary Examinations and, in some cases, Intermediate Science Examinations. Fellows and Associates who are able to offer vacancies to such assistants are invited to communicate with the Registrar.

A number of Registered Students of the Institute desirous of gaining practical experience will be glad to have opportunities of working in private laboratories or works during vacations.

The Library.—The Library is open for the use of Fellows, Associates and Registered Students, between the hours of 10 A.M. and 6 P.M. on week-days (Saturdays: 10 A.M. and 2 P.M.) except when examinations are being held.

The Library of the Chemical Society is also available for the use of Fellows and Associates of the Institute wishing to consult or borrow books, from 10 A.M. to 9 P.M. on week-days (Saturdays from 10 A.M. to 5 P.M.).

Changes of Address.—In view of the expense involved through frequent alterations of addressograph plates, etc., Fellows, Associates, and Registered Students who wish to notify changes of address are requested to give, as far as possible, their *permanent* addresses for registration.

Publications of the Institute.—A few copies of the following publications of the Institute are obtainable by Members and Registered Students at the special prices indicated:—

PROCEEDINGS (prior to 1920). Four Parts annually. 1s. each net.
JOURNAL AND PROCEEDINGS (1920). Six Parts. Each Part 2s. net.
HISTORY OF THE INSTITUTE, 1877-1914. 10s.—Special Edition 21s
LECTURES:

“Cement.” Bertram Blount, F.I.C. 2s. 6d. net.

“Cellulose.” C. F. Cross, B.Sc., F.I.C. 2s. 6d. net.

“Thorium.” Edmund White, B.Sc., F.I.C. 2s. net.

“Chemistry in Gas Works.” W. J. A. Butterfield, M.A., F.I.C. 2s. 6d. net.

“The Research Chemist in the Works with Special Reference to the Textile Industry.” W. P. Dreaper, F.I.C. 2s. net.

“Explosives.” William Macnab, F.I.C. 2s. 6d. net.

EXAMINATION PAPERS. Annual Sets (prior to 1917), 6d. each (7d. by post). After 1917, 1s. post free.

To all other purchasers, the Lectures will be charged at 5s. each; the ordinary edition of the History at 21s., and the Special Edition at £2 2s.

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THE
INSTITUTE OF CHEMISTRY
OF
GREAT BRITAIN AND IRELAND.

FOUNDED, 1877.
INCORPORATED BY ROYAL CHARTER, 1885.

JOURNAL AND PROCEEDINGS.
1921.

PART III.

Issued under the supervision of the Publications Committee.

RICHARD B. PILCHER,
Registrar and Secretary.

30, RUSSELL SQUARE, LONDON, W.C. 1.
June, 1921.

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Proceedings of the Council.

Election of District Members of Council.—Nominations for the election of District Members of Council having been invited from the Districts determined at the Extraordinary General Meeting held on February 28th, the following Fellows were returned unopposed and were declared duly elected District Members of Council for their respective Districts, as follows :—

- (iii) Liverpool and North-West Coast : John Hanley.
- (iv) London and South-Eastern Counties :
Alfred Vincent Elsdon, B.Sc.
- (v) Manchester and District : William Marshall.
- (vii) Edinburgh and East of Scotland :
Thomas William Drinkwater, L.R.C.P., L.R.C.S.
- (viii) Glasgow and West of Scotland : James Macleod.
- (x) Ireland : Alfred Godfrey Gordon Leonard,
A.R.C.S.I., B.Sc., Ph.D.

Nominations were received in respect of Districts (vi) North-East Coast and Yorkshire, and (ix) Wales (excluding the County of Flint), and the County of Monmouthshire, and on ballots being taken the following were duly elected :—

- (vi) North-East Coast and Yorkshire :
Cyril Joseph Heath Stock, B.Sc.
- (ix) Wales and the County of Monmouthshire :
George Rudd Thompson.

No nominations were received in respect of Districts (i) Birmingham and Midlands, (ii) Bristol and South-Western Counties, and (xi) The Overseas Dominions, the Empire of India, and Abroad. The seats for the District Members of Council for those Sections therefore remain vacant.

Election of an Ordinary Member of Council.—Mr. Francis Arthur Freeth, O.B.E., M.Sc., has been elected a member of Council in the place of Mr. John Rogers, O.B.E., who has resigned his seat owing to pressure of other duties.

Fine Chemicals, Laboratory Glass and Porcelain.—The publication, in Part II., of the memorandum prepared by the Special Purposes Committee (1920-21) on fine chemicals and other laboratory requirements has attracted correspondence both from users and manufacturers. Among the former a few complaints have been received with regard to quality, failure of supply, and price. Such complaints are the subject of conference, so far as possible, between the Special Purposes Committee and the manufacturers concerned. The manufacturers appear to have appreciated the publication of the memorandum by the Council of the Institute, who desire to help all concerned, in the belief that the future progress of chemical industry and the profession of chemistry in this country will be very largely dependent on the ability of the manufacturers to meet satisfactorily the requirements of the profession. These discussions, moreover, have clearly demonstrated the fact that manufacturers prefer frank criticism to covert discontent. It is hoped, therefore, that members will give British producers a fair chance in order that by mutual co-operation the difficulties which stand in the way of the firm establishment of the industries concerned may be steadily overcome.

Meldola Medal.—A medal, to be known as the Meldola Medal, will be presented annually by the Society of Macabaeans, for the most meritorious chemical work of the year carried out by a British subject of not more than 30 years of age at the time of the completion of the work.

The object of the institution of the medal is to recognise merit on the part of a rising member of the profession of chemistry, and at the same time to keep alive the memory of the distinguished chemist who had held office as President both of the Society presenting the medal and of the Institute of Chemistry.

The award will be administered by the Council of the Institute and a member of the Society of Maccabaeans appointed by the Committee of the Society, who shall be at liberty to withhold it in the event of no work of sufficient excellence in their opinion being brought to their notice.

Power to vary the above conditions is vested in the Committee of the Society of Maccabaeans and the Council of the Institute of Chemistry acting jointly.

A plaster cast of the obverse of the medal—a profile of Prof. Meldola—has been received by the Council, and has been placed in the Library of the Institute.

The Council hope that the first presentation of the medal will be made by the President of the Institute at the Annual General Meeting, on March 1st, 1922.

Public Analysts.—The Public Appointments Committee has dealt with several matters affecting the interests of Public Analysts, and has made representations to the Ministry of Health thereon.

With regard to an official memorandum of the Ministry—36 : Foods—the Ministry was informed that public analysts took exception to the encouragement of “rough sorting methods” in dealing with informal or test samples taken in connection with the administration of the Sale of Food and Drugs Acts, and especially to the suggestion, in Memorandum 36, that such rough sorting should be entrusted to the public analyst or “some other person.”

The hope was expressed that the Ministry would see its way to modify any circulars dealing with such subjects to provide for the work being undertaken by competent persons.

The Ministry holds that the system of taking informal samples has been justified by experience; that the local authorities are unlikely to give it up, and that it would be difficult to disallow a certain amount of rough sorting by sanitary inspectors, but the effect of the paragraph in question may be modified, in future circulars, to provide that the rough sorting should be carried out “by the public analyst or other

authorised person," while the Ministry intends to keep itself informed of the sorting methods employed.

On the question of the Ministry intervening in cases where local authorities offer inadequate terms for public analysts' appointments, the Ministry holds that it should decline to take action in respect of those appointments in which the analysts are free to conduct other practice, but might consider the matter differently in instances where inadequate terms are offered for whole-time appointments.

Public Analysts also complained that they did not receive copies of memoranda and regulations issued by the Ministry. All communications with the Ministry pass through the Clerks to the local authorities, and not only public analysts, but medical officers, complain that communications in which they are specially concerned frequently do not come to their notice. The Ministry has been asked to send copies of memoranda relating to public analysts to the Institute for notification in the Journal and to the Society of Public Analysts for notification in *The Analyst*.

Reference has already been made to correspondence which has passed between the Institute and the Ministry of Food and the Board of Trade on the proposal to introduce a new Food Bill. The Councils of the Institute and the Society of Public Analysts have notified the Ministry of Health that they are anxious to afford the Government every assistance in their power when such a measure is in contemplation. A Joint Committee of the Institute and the Society is, in fact, taking steps to collect from public analysts useful information bearing on such legislation ; but it appears probable that the measure may be delayed for some time.

Public Analysts are urged, however, to forward to the Registrar of the Institute particulars of any unusual and glaring examples of misdescription of foods, and particulars of difficulties with which they have had to contend owing to the lack of standards and definitions of food products. As an example of misdescription the term "egg-powder" is applied to mixtures containing no egg.

Irish Appointments.—Many appointments as public analyst and as drug analyst to unions have become vacant owing to the death of Sir Charles Cameron. The Public Appointments Committee have had before them particulars of the reports of meetings of local authorities and copies of announcements made with regard to filling the vacancies referred to. These particulars disclose widely varying conditions, in many cases disadvantageous to the analyst and prejudicial to efficient administration.

It is to be hoped that the Government will take this opportunity to effect, as far as prevailing circumstances permit, an alteration in the previous unsatisfactory conditions, and that public analysts in Ireland will thereby be able to improve the position of the profession in that country.

Dangerous Drugs Act.—The main object of this legislation is to prevent the increase of the drug habit. The Report of the Committee appointed by the Home Secretary to advise on the Draft Regulations under the Dangerous Drugs Act, 1920, has recently been published (Cmd. 1307). The Report deals largely with objections raised and evidence given by the representatives of medical, pharmaceutical, and veterinary bodies with regard to the original draft regulations under the Act, and submits regulations for the consideration of the Secretary of State. In conformity with this report and partly in response to representations made by the Councils of the Institute and the Society of Public Analysts, the Home Secretary has included, in the Regulations made under Section 7 of the Act (S.R.O., 1921, Nos. 864 and 865), certain references of interest to members of the Institute.

The drugs to which the Act and the Regulations made thereunder apply are "morphine, cocaine, ecgonine, and diamorphine (commonly known as heroin) and their respective salts, and medical opium, and any preparation, admixture, extract or other substance containing not less than one-fifth per cent. of morphine or one-tenth per cent. of cocaine, ecgonine or diamorphine," the percentage in the case of morphine being calculated as in respect of anhydrous morphine.

S.R.O. 864 provides the following Regulations :—

1. No person shall supply or procure, or offer to supply or procure, raw opium to or for any person whether in the United Kingdom or elsewhere, or shall advertise raw opium for sale—

- (a) unless he is licensed by the Secretary of State or is authorised by these Regulations or by any authority granted by the Secretary of State to supply raw opium, or unless he is licensed by the Secretary of State to import or export raw opium, or
- (b) otherwise than in accordance with the terms and conditions of such licence or authority.

2. No person shall supply or procure, or offer to supply or procure, raw opium to or for any person who is not licensed or otherwise authorised to be in possession of raw opium nor to any person so licensed or authorised except in accordance with the terms and conditions of such licence or authority.

3. No person shall be in possession of raw opium unless—

- (a) he is licensed to import or export raw opium, or
- (b) he is licensed or otherwise authorised to supply raw opium, or
- (c) he is otherwise licensed by the Secretary of State or authorised by these Regulations or by any authority granted by the Secretary of State to be in possession of raw opium.

4 gives the provisions with which persons supplying raw opium must comply with regard to keeping records.

5 provides that—

“Any duly qualified medical practitioner, or any person lawfully keeping open shop for the retailing of poisons in accordance with the provisions of the Pharmacy Act, 1868, as amended by the Poisons and Pharmacy Act, 1908, or any person employed or engaged in dispensing medicines at any public hospital or other public institution being a person duly registered under the Pharmacy Act, 1868, as amended by the Poisons and Pharmacy Act, 1908, or any registered veterinary surgeon or any person in charge of a laboratory for purposes of research or instruction attached to any University, University College, public hospital or other institution approved by the Secretary of State for the purpose, or any person appointed by a local authority with the approval of the Minister of Health as an analyst for the purposes of the Sale of Food and Drugs Acts, 1875 to 1907, is hereby authorised so far as is necessary for the practice of his profession or employment in such capacity to be in possession of and supply raw opium, but subject always to the provisions of the foregoing regulation.”

6 provides for the withdrawal of authorisation for breach of the Act ; 7 regulates the procedure of delivery to messengers ; 8 defines possession, “in the order or disposition of any person” ; 9 : application to Ireland ; 10 provides that the Regulations come into force on September 1st, 1921.

S.R.O. 865, referring to the other drugs before-mentioned,—provides similar Regulations to those contained in S.R.O. 864

with regard to manufacture, sale, distribution (including the giving and dispensing of prescriptions), possession, and the keeping of records, besides provisions for marking packages and bottles containing such substances.

Under Regulation 11—

“Any duly qualified medical practitioner, or any registered dentist, or any registered veterinary surgeon or any person employed or engaged in dispensing medicines at any public hospital or other public institution being a person duly registered under the Pharmacy Act, 1868, as amended by the Poisons and Pharmacy Act, 1908, or any person in charge of a laboratory for purposes of research or instruction attached to any University, University College, public hospital, or other institution approved by the Secretary of State for the purpose, or any person appointed by a local authority with the approval of the Minister of Health as an analyst for the purposes of the Sale of Food and Drugs Acts, 1875 to 1907, is hereby authorised so far as is necessary for the practice of his profession or employment in such capacity to be in possession of and supply the drugs.”

12 provides for the withdrawal of authorisation ; 13 deals with delivery to messengers ; 14 defines possession ; 15 provides for authorisation to the master of a ship to administer and supply the drugs to any member of the crew in accordance with the instructions prepared or sanctioned by the Board of Trade ; 16 provides that

“The Secretary of State may exempt from the operation of these regulations any hospital or other public institution subject to the observance of such conditions as he may by order prescribe.”

17 exempts certain preparations (named in a Schedule), and also any of the drugs when denatured in a manner approved by the Secretary of State ; 18 deals with the application of the Regulations to Ireland ; and 19 provides that the Regulations come into operation on September 1st, 1921.

The Councils of the Institute and the Society of Public Analysts have been informed that the Secretary of State will be prepared to consider any applications for licences under the Dangerous Drugs Act from Fellows and Associates of the Institute who show to his satisfaction that the drugs are needed by them for carrying out investigations arising in the course of their professional practice and employment.

Entries in Directories, Diaries, &c.—The proceedings of the Conference held on February 27th (reported in the Journal, Part II.) on the subject of the entries of the names of members of the Institute in directories, diaries, &c., have

been referred to the General Purposes Committee with authority to consult the solicitors of the Institute as to the action which should be taken to give effect to the resolutions passed at the Conference.

The Conference was not called as an Extraordinary General Meeting, but as a meeting for discussion, and it was attended by only about twenty members.

The solicitors were asked to suggest means whereby an opinion, with regard to professional procedure generally accepted by the Institute, should be accepted by the Censors as guidance in investigating complaints which may come before them.

The question was referred to counsel, who briefly discussed the provisions of the Charter and By-Laws with regard to the investigation by the Censors of alleged unprofessional offences, as follows :—

“ Clause 16 of the Charter vests in the Council the power to exclude or suspend any member who commits any offence therein specified. One of the grounds for exclusion or suspension is that the Council have held that the member is guilty of an act or default discreditable to the profession. The Charter does not attempt further to define this offence. Clause 10 of the Charter however provides that the powers of the Council are to be exercised in accordance with and subject to the provisions of the Charter and By-Laws and subject to the control and regulation of any general meeting.

“ By-Laws 54 and 56 provide machinery for the assistance of the Council in the exercise of their powers of expulsion or suspension. Censors must be elected at each annual meeting and to them is entrusted the duty of investigating any alleged offence.

“ By-Law 57 enumerates certain acts which are to be deemed discreditable to the profession within the meaning of the Charter, but it is expressly provided that their enumeration is not to be treated as an exhaustive definition. In my opinion it is clearly within the power of any general meeting to control and regulate this matter further by passing resolutions to the effect that certain other acts or defaults shall also be deemed to be discreditable. The Council in the exercise of their powers would be bound to have regard to such resolutions, and it follows that the Censors also would be similarly bound inasmuch as their duty is that of assisting the Council by hearing and investigating charges and reporting to the Council any case in which they think it necessary for the Council to exercise the power of expulsion or suspension.”

Counsel advised that, in order to give effect to the Resolutions passed at the Conference, a formal Resolution on the

subject should be submitted to a Special General Meeting, and that the Resolution should provide that any breach of the Regulations adopted by the meeting should be deemed by the Censors and the Council to be a discreditable act within the meaning of Section 16(3) of the Charter, and that the Censors and Council should act accordingly.

On receiving the opinion, the Council, on the advice of the General Purposes Committee, decided to postpone immediate action in the matter, since it would be reasonable that members should be allowed time to comply with the Resolutions passed at the Conference, and some might have made arrangements for entries in publications already in preparation. The Council hope, however, that Fellows and Associates of the Institute will accept the Resolutions passed by the Conference, and thus establish the principles involved, and render further proceedings unnecessary.

Duty-Free Alcohol.—The Legal and Parliamentary Committee have reported to the Council on the question raised by the Liverpool Section, whether further facilities should be granted to chemists for obtaining duty-free alcohol for analytical and research purposes. The Board of Customs and Excise will not ordinarily sanction the receipt of such alcohol except by universities, colleges, and public institutions. The Committee learned that this matter had also been brought to the notice of the Federal Council for Pure and Applied Chemistry.

For many laboratory operations dehydrated industrial methylated spirit is suitable, and it would be reasonable to expect chemists to use such spirit where absolute ethyl alcohol is not essential, but the Committee recommended that the Council should address the Board of Customs and Excise, asking for further facilities on the lines indicated. The Committee also suggested that when a supply of methyl and ethyl alcohol had been purchased and used by a chemist, he should be entitled to claim the return of the duty thereon, on proving to the satisfaction of the Customs authorities that it had been used exclusively for professional or research purposes. The matter is proceeding.

Department of Scientific & Industrial Research.—

Attention has been directed to the Parliamentary Estimates of the Research Department for the year 1921-22, with particular reference to Clause D.2—Research Boards and Committees—Development (Grant in Aid) : Provision for expenses of further development of the work of Boards and Committees for Government Research.

The estimated expenditure for the year 1920-21 was stated as £200,000. The corresponding estimate for the year 1921-22 was £39,500 ; a decrease of £160,500. The total estimated decrease in expenditure for the whole of the activities of the Department was stated as £140,845.

The decrease in the estimates appeared to be a matter of serious concern to research workers, but, on inquiry, it was ascertained that the estimates were not necessarily an indication of what the Department would spend during the period, and, in fact, it anticipated spending more this year than last. The sum of £200,000 was received in the previous year as the possible cost of the work that the Department might be asked to undertake ; but experience had shown that the sum of £39,500 was more likely to be the approximate amount that would be required during the present year, while any balance of the grant unexpended at the end of the financial year was not liable to surrender.

Committee on Incidence, Causes and Prevention of Blindness.—At the invitation of the Committee appointed by the Ministry of Health to enquire into Causes and Prevention of Blindness, the Council appointed Sir Robert Robertson and Mr. William Macnab to give evidence with regard to accidents causing blindness or impairment of vision, incurred among workers in chemical industries generally and in chemical laboratories of all kinds.

At the request of the Committee, Sir Robert Robertson prepared some notes regarding the incidence of blindness through chemical operations. He stated that, although he had controlled at one time over a hundred chemists and

physicists and a like number of assistants engaged on the investigation of explosive substances and the determination of their properties, his experience of over twenty-five years did not point to such work being specially dangerous provided due precautions were taken.

As to precautions, the quantities of the explosive substance under investigation were kept down to a reasonable minimum, goggles were worn in all circumstances where there was a likelihood of explosion, and the work was entrusted to competent chemists. The goggles were of a specially reinforced type, and were submitted to severe test before use. Operations such as determining the melting point of explosives were carried on behind a glass screen. Special accommodation was provided for the handling and storage of explosive compounds, and all explosives were removed from the laboratory every night, as a precaution against the spontaneous inflammation of unstable substances and the possibility of fire from any cause. For such storage, lockers were built, away from the laboratory, into a mound with a front baffle of sleepers.

Work with larger quantities than those handled in the laboratory was conducted behind shields or in specially armoured chambers provided with suitable mechanical contrivances. These precautions required constant supervision and care on the part of those responsible for the work, who were scientific men who had studied the properties of and effects produced by the bodies with which they were working. Much of the work of such scientific men, however, did not involve the handling of sensitive or dangerous bodies and was conducted in laboratories equipped for research in organic chemistry.

In the manufacture of explosives, large quantities of acids were handled, but although accidents occurred from spillages, the frequency with which operatives escaped injury to the eye was remarkable.

The ordinary risks of a chemist were minimised by his training. Thus, he would have been taught the safe methods

for opening a Carius tube which was under pressure. An instance was known of a student losing an eye through looking down a Carius furnace when the glass tube exploded. Again, in carrying out a fusion with caustic potash, some of the contents of the silver capsule was projected into a chemist's face and involved injury to his eye. The process of diazotising had been known to assume such violence as to be explosive and to damage a student's eye.

Generally, in laboratories, there were some risks, but they were small, and provided against when the laboratories were under control of properly qualified persons.

At the hearing, Sir Robert supplemented the above statement, and Mr. Macnab gave evidence from his long experience, in explosives and other industries, during which he had very rarely known a case of blindness arising from accidents either to chemists or operatives. The Registrar, who was in attendance at the hearing, was also questioned as to the prevalence of blindness among chemists. He said that during nearly thirty years with the Institute he had not known of more than twenty cases among 8,000 or 9,000 chemists.

The Committee appeared to be more especially concerned with the safety of operatives, since chemists were in most circumstances able to protect themselves, and at the conclusion of the hearing asked for a specimen pair of the goggles referred to by Sir Robert Robertson, who promised to supply them.

The Title "Chemist."—The Liverpool and North-Western Counties Section has forwarded a resolution urging the Council to take action to restrict to persons practising chemistry and registered by a competent registration authority, such descriptions as "chemist," "chemical practitioner," "analyst," "analytical chemist," "consulting chemist"; and the Committee of the Newcastle-on-Tyne and North-East Coast Section has intimated that, without prejudice to the question as to the continuance of the use of

the term "chemist" by pharmacists, it gives general approval to the resolution of the Liverpool Section.

The matter has been referred to the Legal and Parliamentary Committee.

Women Chemists.—The question of equal pay for men and women chemists engaged on the same work is frequently under discussion, and the Council have recently been asked for an expression of opinion on the subject. The formulation of a definite and comprehensive statement is rendered difficult owing to the greatly varying nature of the work of chemists and of the conditions under which they are required to work. In professional work, where payment according to merit should be the rule, the fixing of a flat rate and even the provision of a scale, which is often unavoidable in large establishments, cannot provide for equitable remuneration in every case.

The Institute has admitted women to membership since 1892, and makes no distinction between men and women in the requirements either for the Associateship or the Fellowship.

In the matter of the employment of women as chemists, the view is held that, so far as routine work is concerned, the insistence upon equal pay for men and women of equivalent qualifications and working an equal number of hours with the same ability, would be likely to tend to the unemployment of women through preference being generally given to men, even when questions of mere economy are not of great importance. It is doubtful, therefore, whether the acceptance of the principle of the equal payment of women chemists engaged in routine work would not be detrimental to their own interests.

In research, and other work, however, where special individual merit—originality, initiative, etc.,—is a more prominent factor, the view is held that the scale of remuneration should depend on merit and good work, and, in general, that where there is equality in these respects, there should be no distinction in salaries on the ground of sex.

Registered Students.—The Council have asked the Local Sections to consider a memorandum based on suggestions received from Mr. D. G. Murdoch, Registered Student, having in view the desirability of furthering the interests of Students of the Institute.

Briefly stated, these suggestions are—

- (1) That the Institute should encourage further intercourse between the Registered Students of the Institute ;
- (2) That the Institute should provide opportunities for Students to discuss matters of common interest, should arrange for Fellows of the Institute to give addresses on various branches of professional and industrial chemical work, and encourage students themselves to give papers before meetings of students ;
- (3) That the Institute should arrange “ exhibit evenings ” at which students could show specimen of preparations, and at which could be shown special or complicated apparatus, laboratory devices, diagrams, charts, etc., of interest to students ;
- (4) That the Institute should arrange social evenings for students.

These suggestions involve the formation of Students Societies, possibly under the various Local Sections of the Institute. Already several Sections have invited Registered Students to attend meetings at which technical papers have been submitted and, incidentally, it may be mentioned that the London Section has recently urged the importance of inculcating in Students as early as possible a sense of the realities of professional life.

The replies from the Local Sections will be considered by the General Purposes Committee, who will report in due course to the Council.

Finsbury Technical College.—Reference was made in Part II. to the decision of the London County Council to assist in the maintenance of Finsbury Technical College. On a report from the Finance and House Committee, the Council of the Institute regret that they have been obliged, in view not only of the financial position of the Institute, but also the provisions of the Charter, to report that the Institute is unable to respond to the appeal for financial assistance in the development of the College. The Council hope, however, that reference to the matter here may be the means of securing for the College a measure of support from past Students and from employers and others who know of its good work.

The College authorities have now announced their intention of appointing professors in various departments of the College.

Lectures.—Mr. Horatio Ballantyne, Vice-President, has kindly promised to deliver in the autumn of this year a lecture on Chemists and the Patent Laws with special reference to the Patents and Designs Act 1920, and its application to chemical patents. Dr. E. J. Russell has kindly agreed to give a Lecture on Agricultural Chemistry and its Applications. Other lectures will be announced in due course.

The Council again desire to emphasize the desirability of Fellows and Associates taking advantage of any opportunity to popularise chemistry and will be glad to hear from Fellows and Associates who have given or arranged to give lectures with that object in view. They particularly refer to lectures delivered before foremen and operatives by chemists in industrial undertakings.

Regulations.—The degree of M.Sc. of the University of New Zealand has been added to the list of those recognised under Section IV. (II.) of the Regulations, page 19, provided that candidates have obtained first or second class honours in chemistry in that examination.

The Regulations for the admission of Students have been revised to conform with the provisions of the new By-Laws.

A candidate for registration must be a British subject, at least 16 years of age; he must have passed an approved Preliminary Examination in the required subjects, and be proposed for admission by a teacher in an institution recognised by the Council, or* by a Fellow with whom he is studying, or,*† in exceptional circumstances, by a chemist in a laboratory or works which is approved by the Council and in which he is studying.

With a view to keeping in touch with registered students other than those admitted on the recommendation of a teacher in a recognised institution, the Council will require every such student to obtain before 30th November in each year from the Fellow or chemist under whom he is registered a report of his progress during the preceding year. The Council will then be in a position to ascertain that the students are following the regulations or, on the other hand, where any student fails to make a return satisfactory to the Council, the desirability of removing his name from the register may be considered. On a registered student ceasing to study under the Fellow on whose recommendation he was registered, he shall be required to apply to the Council for re-registration on the proposal of the Fellow or chemist under whom he is then studying.

Institute's Laboratories.—Fellows and Associates are occasionally allowed the use of bench space in the laboratories of the Institute on terms which are arranged, according to circumstances, with the Finance and House Committee. The Council, however, have decided, on the advice of the

* The Council will require from the proposer an assurance that the student will have facilities in the laboratory for obtaining satisfactory experience in general laboratory work.

*† In the consideration of applications under this clause the Council may accept the registration of a student for the first year of a day course or for the first two or three years of an evening course, at an Institution which is not on the list of Institutions recognized by the Council, on the proposition of the head of the Chemical Department of that Institution.

Committee, that such use shall be restricted to specific investigations, and not extended to ordinary practice or to enable a chemist to start a practice.

Universities and Institutions.—The following institutions have been added to the list of Universities, Colleges and Institutions recognised for the training of candidates for the Examinations of the Institute :—

Paisley Technical College.
 Queen's University, Kingston, Ontario.
 The Constituent Colleges of the University of New Zealand.
 The University of Cape Town.
 The Pretoria University of Stellenbosch.
 The Constituent Colleges of the University of South Africa.

Institutions other than Universities and their constituent Colleges are placed on the list on the understanding that they will be inspected from time to time by at least two representative Fellows of the Institute, preferably present or recent Members of Council, or examiners, with the assistance of an officer of the Institute. Such inspections will be made when officers are visiting Local Sections in the neighbourhood of the respective institutions, and the Council intend to arrange that all such institutions shall be visited during the next three years.

Examinations.—The Council have received a report from the Board of Examiners on the April Examinations (p. 210).

Memento of 30, Bloomsbury Square.—The premises occupied by the Institute from 1893 to 1915 and the adjoining houses in Bloomsbury Square have lately been entirely demolished to prepare the site for the Liverpool Victoria Friendly Society. Through the courtesy of the Architect to the Society, Mr. Charles W. Long, F.R.I.B.A., the Institute has been presented with a sufficient quantity of oak from the floors of the old premises for the construction of a table for the Library of the Institute. The house was situated on the east side of the Square, formerly known as Seymour Row, and adjoined the

residence occupied by Lord Mansfield (1705-1793), which was demolished by rioters in 1780, and that of Sir Anthony Panizzi (1797-1878), Principal Librarian of the British Museum. The house is said to have been built in 1665, the oak referred to, which is in sound condition, forming part of the original structure.

Appointments Register.—The Appointments Register of the Institute was well able during 1920 to deal with the influx of large numbers of newly-trained men, but the position to-day is much more difficult. The number of members, including many with several years' experience, whose names are on the Register, has steadily increased from about 160 in August, 1920, to about 260 in the present month. Of these the majority are seeking to improve their positions, or possibly, in some cases, anticipate that the present industrial depression may result in their unemployment, while the number actually out of employment has increased from about 20 in August, 1920, to 50 in March, 1921, and to about 60 in the present month. This condition of affairs gives emphasis to the concern which has been expressed from time to time that it would not be possible to find suitable employment for the exceptional number of students who have entered on a course of training for professional chemistry since the end of the War.

Under normal conditions there is a constant flow of junior members to higher posts leaving vacancies for the newcomers, but in the present circumstances this flow has almost stopped because in many cases employers have postponed filling such vacancies.

In answer to enquiries addressed by the Institute to the recognised universities and colleges, information has been obtained to the effect that 800 chemical students will complete their academic training before the close of this year. A fair proportion of these will take up teaching work and others will remain at college for a year's research ; but even allowing for these deductions the number seeking employment will be far in excess of the vacancies likely to be available.

Fortunately the dates of the Final Degree Examinations of the various Universities do not all coincide, and consequently the output of newly qualified chemists will be more gradual than it would be if the Final Examinations were held simultaneously, in which case the difficulty of placing such chemists in suitable appointments would be greatly increased.

The majority of the new graduates will be ex-service men whose training was interrupted by the war, very few of whom have had any previous experience or are in a position to support themselves without employment. The Institute is anxious to assist them in every way possible to make a start in their professional careers, and the Council seek the co-operation of Fellows and Associates generally in finding them opportunities for gaining experience. In many instances this may be done by members allowing temporary facilities in their laboratories until the conditions of industry and commerce have improved with a consequent heavy demand for chemists. They should then be readily absorbed, but for the present they will need all the help that established members of the profession can give them.

Vol. IV. of the Annual Tables (Chemical, Physical and Technological) of Constants and Numerical Data is now in the press. Particulars thereof are circulated with this number of the Journal at the request of the General Secretary of the International Committee, which has compiled the tables.

The International Committee was appointed by the 7th International Congress of Applied Chemistry, held in London in June, 1909, and the tables are published under the patronage of the International Union for Pure and Applied Chemistry. Members of the Institute are entitled to subscribe for the tables at the reduced price of 75 francs unbound and 90 francs bound, provided application be made before July 15th next, an extension of the time having been arranged owing to the fact that the Journal cannot be published before June 30th—the date originally fixed.

Local Sections.

Belfast and District.—A Local Section has been formed for Belfast district. Members interested are advised to address enquiries to the Hon. Secretary, Dr. W. H. Gibson, O.B.E., F.I.C., c/o Messrs. The York Street Flax Spinning Co., Ltd., Belfast.

Bristol and South Western Counties District.—A Local Section is being formed with headquarters at Bristol. The inaugural meeting will be held when travelling facilities have improved. Members interested are requested to address enquiries to Prof. J. Wertheimer, D.Sc., F.I.C., Merchant Venturers' Technical College, Bristol.

Edinburgh and East of Scotland.—The Second Annual Dinner of the Section was held at Ferguson and Forrester's Restaurant, Edinburgh, on March 1st, Dr. Leonard Dobbin in the chair. A musical programme was provided by members of the Section.

Glasgow and West of Scotland.—A golf competition in connection with the above section was held over the West Kilbride Course on April 30th by the invitation of the Ardeer members and by the courtesy of the committee of the West Kilbride Golf Club. There was a turn-out of about twenty-five members. The visitors were rather fewer than was expected—due, possibly, to the restricted train service in operation on account of the coal strike. The competition took the form of a stroke sweepstake. The day was

exceptionally fine, and the meeting was pronounced a success. Best scores :—(1) and (2) W. Barbour (18) and J. W. McDavid (18), 81 ; (3) J. Sorley (7), 82. The visitors were entertained to lunch and tea. After tea, Mr. Macleod proposed a vote of thanks to the Ardeer members and to the Committee of the Club, which Mr. Rintoul acknowledged.

Irish Section (Dublin).—The Committee of the Section has discussed the question of forming a Students' Society, and it proposes to do everything to encourage students to attend Section Meetings and to become members of the Institute, postponing, for the present, in view of the small number of Registered Students of the Institute in Ireland, the formation of a definite Society.

Liverpool and North-Western Counties.—The Section has forwarded to the Council resolutions urging that action be taken to restrict to persons practising chemistry and registered by a competent registration authority such descriptions as "chemist," "chemical practitioner," "analyst," "analytical chemist," and "consulting chemist" (see p. 180).

The Section has also urged the Council to endeavour to secure further facilities whereby chemists may obtain duty-free absolute ethyl alcohol for professional and research purposes (see p. 177).

London and South-Eastern Counties.—On Wednesday, April 20th, a debate was held on a motion by Mr. F. H. Carr "That the Institute, as representing the profession of chemistry, should support legislation to protect the manufacture of chemicals and chemical glassware as being key industries."

Mr. Carr referred briefly to the increasing facilities for primary and secondary education and the consequently larger numbers from whom relatively skilled workers could be recruited in order to carry on such industries as the production of fine chemicals and laboratory ware. He referred to the position in which this country was placed at the outbreak of

war by its reliance upon continental supplies, and expressed the hope that the country would not revert to a state of dependence on outside sources through lack of support by the users of such materials. He submitted figures to indicate that the imposition of protective measures did not necessarily involve an increase in the cost of the materials whose manufacture was so fostered. He cited as an example *saccharin*, very little of which, prior to the war, was manufactured in this country. We were now in a position to manufacture all our requirements, and were producing and selling at a price which, apart from any protective tariffs, gave no inducement to importers to bring material from abroad. He maintained that this example should allay the fears of any who were nervous as to the effect of the measures proposed in the Key Industries Bill.

Mr. E. M. Hawkins opposed the motion. He agreed with the opener with regard to the necessity for fostering British chemical and glass industries, but he did not feel that the methods which were being proposed were in the best interests of those industries or of the users of their products. He felt that, despite the example which Mr. Carr had given, chemists had no guarantee that the price of these products would be kept within reasonable bounds, and that the proposition of an *ad valorem* duty was committing chemists and the country to a leap in the dark. It were much better (although he objected to doles and subsidies) to give a straightforward subsidy to an industry to assist it to get on a proper footing and thereafter to let it stand (or fall) on its merits.

In the discussion which ensued, Dr. Brady, Mr. Collett, Mr. Hussey, Mr. Cook, Mr. Macnab and others joined. The meeting was not very well attended in view of the restrictions of the train service. Over 40 members were present, and some had left when the vote was taken and it was found that 16 were in favour of and 10 against Mr. Carr's motion.

A further meeting of the Section was held on Wednesday, May 18th, at which a memorandum with regard to a proposal

for an association of students was considered. After some discussion it was decided to invite the Secretaries of the Chemical Societies of the various recognised colleges in the London area and a number of other representative students to meet the Chairman and Secretary of the Section for an informal conference in order to obtain the views of students themselves. The meeting, on the whole, rather than the formation of a separate Students' Society, favoured the policy of inviting students to meetings of the Section and of arranging one or two evenings in each session as Students' Evenings in order to provide opportunities for students to meet members of the Institute.

At the conclusion of the discussion, Mr. Pilcher gave a very interesting informal *resumé* of the history of the Institute. His remarks were interspersed with anecdotes concerning the chemists of the early days of the Institute. In the time which was available, however, he was only able to touch very briefly on the later stages of the history, and the Section hope at a future meeting to hear him again on the subject. A vote of thanks was accorded, on the motion of Dr. Dyer, who referred to details of the foundation of the Institute.

On Wednesday, June 15th, an informal meeting of the Section was held, by the courtesy of Mr. H. S. Wellcome, at the Wellcome Historical and Medical Museum, which was specially opened in the evening for the members of the Section. The Museum contains a remarkable collection of medical and pharmaceutical exhibits and many of great interest to chemists. Members particularly noticed reproductions of alchemical laboratories and of Liebig's laboratory, and also the mask of a plague doctor attributed to the seventeenth century, a forerunner of the modern gas mask.

Newcastle-upon-Tyne and North-East Coast.—The Section has transmitted to the Council a resolution supporting "without prejudice to the question of the continuance of the use of the word 'chemist' by pharmacists," the first resolution of the Liverpool Section referred to on p. 189.

The Section finds it difficult to keep in touch with the whole of the North-East Voting District,—which includes Yorkshire, Northumberland, and Durham—containing in all about 400 members, and proposes at an early opportunity to hold a meeting in a convenient centre, say, at York, to discuss the matter. Possibly the problem will be solved by the formation of a new Section or Sections, or by arranging for meetings of the Section to be held in several important centres in rotation.

South Wales.—A meeting of the South Wales Section was held at the Hotel Metropole, Swansea, on Saturday, May 28th, when Mr. Marlow, Assistant Secretary of the Institute, attended.

The Section discussed the question referred to them by the Council as to how far the Local Sections could promote the interests of Registered Students of the Institute. The members present were found to be in favour of Students being attached to Sections without payment of additional subscription, in order that they should be able to attend meetings, although unable to vote.

Prof. J. E. Coates gave an interesting paper on Hydrocyanic acid, in the course of which he described the difficulties to be met with in the manufacture of the anhydrous acid, and how they had been overcome; he also dealt with the construction and development of plant for production of large quantities of the acid.

A hearty vote of thanks was accorded the lecturer.

Personal.

Col. William Henry Willcox, C.B., C.M.G., has been created a Knight Commander of the Most Eminent Order of the Indian Empire.

Prof. John Burchmore Harrison, C.M.G., has received the honour of Knighthood.

Prof. Robert Robinson has been appointed to the Chair of Chemistry in the University of St. Andrew's, in succession to Prof. J. C. Irvine, who has been elected Principal of the University.

The Council deeply regret to record that Mr. Gruffyd Thomas Speakman, B.Sc., A.I.C., has lost both eyes as the result of an explosion. Mr. Speakman, who was trained at University College of North Wales, Bangor, was engaged as an explosives chemist during the war at Faversham, and afterwards at Ardrossan. In 1920 he proceeded to the British Westfalite Co., at Denaby, near Rotherham, where the accident occurred, on March 14th.

A Chemist as Poet.—A small volume of Poems, entitled *Samson Adami and other Essays in Verse*, by Mr. Oliver C. de C. Ellis (Associate of the Institute), with an introduction by Prof. C. H. Herford, has recently been published by Messrs. Sherratt & Hughes, Manchester (one shilling net). The volume includes "A Chemical Fragment (On Kekulé's defence of his Benzene Formula)."

Notes.

Official Chemical Appointments Overseas.—A Colonial Office paper (Miscellaneous No. 280, Fifth Edition) on Agricultural, Forestry and other Scientific Appointments in the Colonial Service, gives considerable information for the assistance of intending applicants for such appointments.

Vacancies are only occasionally open to candidates under the age of 22 at the time of taking up their duties. Candidates may, however, apply before they reach the minimum age limit in order that their applications may be completed in time to be considered at the earliest possible moment. The age limits for all junior appointments in Tropical Africa are 22-35, candidates under 30 being preferred.

No candidate will be considered for appointment who has not served in some branch of the forces during the war unless his reasons for not doing so are entirely satisfactory to the Secretary of State.

Appointments at the disposal of the Secretary of State are confined to those Colonies, Protectorates, etc., which are administered under his directions :—

In Tropical Africa, including the Kenya Colony and Protectorate, and the Uganda Protectorate, Nigeria and the Gold Coast ;

Eastern Colonies and Protectorates, and Protectorates such as Ceylon, Hong Kong, the Straits Settlements, and the Malay States ;

The West Indian Colonies, such as Jamaica, Barbados, the Windward and Leeward Islands, and Trinidad, together with British Guiana and British Honduras ;

Fiji ;

Cyprus ; Gibraltar and Malta ;

Various Islands such as Mauritius, Seychelles, and Bermuda ; Palestine, Mesopotamia, and Aden.

The Secretary of State does not select candidates for appointments for the Self-Governing Dominions, such as Canada, Australia, New Zealand, the Union of South Africa, and Newfoundland, information with regard to which is obtainable

from the High Commissioners or Agents-General in London ; nor for Egypt and the Sudan, information with regard to which can be obtained from the Eastern Department of the Foreign Office, Downing Street, London, S.W.1.

Enquiries relating to Rhodesia should be addressed to the British South Africa Company, 2, London Wall Buildings, E.C.2 ; and relating to North Borneo, to the British North Borneo Company, 37, Threadneedle Street, London, E.C.2.

General information respecting the Colonial Services can be obtained from the "Colonial Office List," published by Messrs. Waterlow & Sons ; the "Colonial Regulations" governing the Colonial Services generally, showing the rules as to leave of absence, free passages, &c., can be purchased from H.M. Stationery Office (9d. net).

Under Agricultural Appointments, including those of Agricultural Chemists, a note occurs :—

"A chemistry student who wishes to qualify for an appointment as agricultural chemist should refer to the syllabus approved by the Institute of Chemistry of Great Britain and Ireland for the Fellowship Examination in Branch D (Agricultural Chemistry), and it would be to his advantage to possess the certificate of the Institute in that Branch."

For these posts a good scientific university education and some post-graduate work are required. Experience of research is very desirable as is also some experience of the tropics, though the latter is not usually an indispensable qualification.

The salaries attaching to the appointments are given in the paper, but these are frequently subject to special arrangement according to circumstances.

Under Part V., Appointments for Analytical Chemists, the following statements appear.—

"A candidate for one of these appointments should usually be an Associate of the Institute of Chemistry or should possess a good university degree in chemistry. He should also hold the certificate of the Institute of Chemistry in Branch E (The Chemistry (including Microscopy) of Foods and Drugs and Water). The duties and qualifications required vary, but, as a rule, the Government Analyst may be called upon to undertake any analytical work that falls outside the sphere of the Agricultural Chemist,

e.g. the analytical examination of stores such as cement, oils, and paints: the analysis of samples of water, food and drugs; the identification and assaying of ores; bacteriological and medico-legal work. His duties may include the teaching of the native subordinate staff and a certain amount of work outside the laboratory, such as the inspection of cargoes on board ships. Research Chemists are sometimes required to carry out special investigation."

The Memorandum on Present and Pre-War Expenditure (Cmd. 1304), recently published, shows, under Scientific Investigation and Research, an estimate of £141,000 in 1914-15, and £579,000 in 1921-22—an increase of £438,000. The amount of the increase includes:—Scientific and Industrial Research, £180,000; National Physical Laboratory, £110,000; and Fuel Research Station, £50,000.

Army Paper (Cmd. 1138), constituting the Report of the Battles Nomenclature Committee, appointed in August, 1919, records under Summer Operations, 1915, The Battles of Ypres, including (i) Battle of Gravenstafel Ridge, the tactical incident of the first gas attack of the enemy, 22nd and 23rd April; but no mention is made of the first occasion when gas was used by the British Army on September 25th, 1915, or of any subsequent occasion.

Belgian Bureau of Chemical Standards.—At the Second Annual General Meeting at Rome, in July, 1920, of the National Union of Pure and Applied Chemistry (Chemical Section), the Belgian delegates presented a memorandum setting forth the reasons for the formation of a collection of samples of chemical substances of standard purity. As a result, the meeting decided to create a Belgian Bureau of Chemical Standards, and the Belgian Chemical Society has undertaken the task of preparing the collection, which is stored partly in the University of Brussels.

The Society is seeking the co-operation of manufacturers of chemical products by asking them to prepare in their laboratories quantities of the standard substances and to provide the materials and intermediates necessary for the

work, so as to reduce the amount of capital which is kept unproductive by the maintenance of the collection.

The Society also seeks the co-operation of chemists in charge of laboratories, who are invited to forward samples of pure or rare substances, which they may have occasion to prepare, if they are capable of being used as standards. In this connection the Society suggests that chemists who are anxious to conserve their samples would be able to make mutual exchanges of small quantities. (The Society, in this matter, is undertaking a similar work to that which has been undertaken by the Institute in the past year in connection with the shortage of supplies of less known research chemicals.) The Society, though working in Belgium, seeks to be of international service, and asks for the co-operation of chemists throughout the world.

Professional Status.—A Fellow has directed attention to a letter which appeared in the *Sydney Morning Herald* early in February commenting on announcements regarding vacancies under the Public Service Board :—

Head Teacher, blacksmithing : Qualification, Technical experience in the trade ; salary £371.

Head Teacher, plumbing : Qualification, expert knowledge of the trade ; salary £340.

Bio-Chemist, Health Department : Qualification, special training in Bio-Chemistry, Physiological Chemistry, and Immunology ; must hold a University Degree as Bachelor of Science ; salary £298 15s.

Under the *nom de plume* "Perplexed Parent," the writer of the letter comments on the circumstance that a man specially trained in three abstruse branches of science is offered a salary which the authorities do not dare to offer to a plumber, and shows good reason for hesitating whether to give his son a university training or to put him to plumbing.

It is clear from the above that the Australian Chemical Institute and analogous organisations in the British Commonwealth must continue to co-operate actively in fostering among Government Departments a higher appreciation of science if the Empire is to reap the best advantage from its talent.

International Physico-Chemical Symbols.—The Journal of the Chemical Society for April, 1921 (pp. 502-12), contains the Report of the Working Committee, nominated by the late Sir William Ramsay, with the approval of the International Commission for the Unification of Physico-Chemical Symbols. The Committee consisted of the late Sir William Ramsay (Chairman), Dr. Friedrich Auerbach, Prof. P. A. Guye, Prof. P. J. Walden, and Prof. Alexander Findlay (Hon. Secretary). The Committee trust that every means will be taken to encourage the use of these symbols, which they hope may find general acceptance by chemists and physico-chemists, and are to be revised at such times and in such ways as may appear to the Commission to be advisable. The list of Symbols is followed by explanatory remarks.

Institute of Physics.—Many Fellows and Associates will have been interested to note the proceedings of the inaugural meeting of the Institute of Physics, which was held on April 27th at the Institution of Civil Engineers. The aim of the founders is to provide a body, analogous to the Institute of Chemistry, to represent the profession and strengthen the position of workers engaged in physics. It will also form a bond between the various societies interested in physics, such as the Faraday Society, the Optical Society, the Physical Society of London, the Royal Microscopical Society, and the Röntgen Society.

The new Institute will devote itself to the professional interests of physicists, will grant diplomas, organise exhibitions of apparatus, hold conferences, and in due course provide a building for the participating societies.

Sir Richard Glazebrook, who presided at the inaugural meeting, stated that the membership already numbered 300, comprising the leaders of physical science in the country. Interesting addresses were given by Sir J. J. Thomson, Mr. A. J. Balfour, Sir Robert Hadfield, and others. The Secretary of the new Institute is Mr. F. S. Spiers, 10, Essex Street, Strand, W.C.22.

Contracts of Service.

In response to a request from the Manchester Section, and in view of the frequent enquiries which are addressed to the offices of the Institute with regard to chemists' contracts, the Legal and Parliamentary Committee has been asked to consider this matter, with the object of assisting chemists, as well as companies and firms with which they are engaged, by indicating the general principles which underlie such contracts.

Although considerable care has been taken in the preparation of the following article, it must not be regarded as an authoritative statement of the law on the subject, but the Committee hope that the article will be of service to members interested. The Committee, however, desire to add a note of caution, viz. that the interpretation of legal phraseology, or even the legal interpretation of ordinary language, should not be undertaken by those inexperienced in the law. Members who are in any doubt or difficulty regarding their own contracts should obtain legal advice.

The Legal and Parliamentary Committee desire to acknowledge the valuable assistance of Mr. Marlow, Assistant Secretary, in the preparation of the article.

Contracts of service may be verbal or written. It is not wise, however, to enter into a merely verbal contract of employment since, if the arrangement is intended to continue for more than a year, neither party has any legal right in the contract, and neither party can enforce the terms of the agreement. Thus, if a prospective employee agrees in conversation to serve as a chemist at a certain salary for a year and is requested to commence his duties on the morrow or at any subsequent time, this contract cannot be enforced at law, because such a contract cannot be completed within a year. In any event the chemist is entitled to be paid for services

rendered even if the contract not being in writing cannot be enforced according to its terms. It may be remarked, however, that when the employment has, in fact, continued for any period more than a year, during which period a salary has been paid, the Courts, although there has been no written agreement, will presume that such employment was under a contract for a "general hiring," and this implied contract may be enforced. In such cases a point of law will arise in the event of either party wishing to determine the contract, as to whether it is a yearly hiring (i.e. one which can only be determined by notice at the end of any one year of service) or whether it is a custom of the profession that a shorter period of notice is given. In view of this element of doubt and of the fact that in the event of dispute, the terms of the contract must be ascertained by the opposing evidence of the parties concerned, it is clearly desirable that every contract of service should be in writing.

Whether the agreement be verbal or in writing, or in the more formal style under seal, no particular or technical form of words is required by law. It is sufficient if the intention of the parties can be gathered from the words used. Thus a series of letters between the employer and his chemist will constitute an agreement which can be enforced at law by either party provided that the documents fix the consideration for the agreement, which in the majority of cases will be the salary. The whole of the terms of the contract need not be expressed, but there must be "agreement," that is, unity of thought, between the parties. Thus a letter of offer from an employer, followed by a letter from the employee in the following terms, has been held not to constitute a contract. "I agree to your offer to enter your employment at a salary of £—— per annum. The final adjustment of some of the terms of your agreement can be left for further consideration."

A written contract may take the shape of a series of letters, or, as is frequently the case, may be drawn up in formal language. In the former case it is likely that only those covenants or promises will be expressed which affect

the relations between the particular employer and chemist, the covenants which in law govern the relations of every master and his servant being implied, in accordance with the legal supposition that every person knows the law of the land. A formal contract, however, will usually express these general covenants, for the guidance of the chemist who, in actual fact as opposed to legal supposition, may need to be reminded of the duties and rights comprised in the contract. But it must not be assumed that the absence of the expression of any such covenant will affect the legal obligations and rights of the chemist thereunder.

A formal contract is completed between the employer and prospective employee as a matter of mutual business precaution ; but in many cases such a contract may not seem to be required between men who can trust one another to fulfil the spirit of a legal document. On the other hand, where such a contract is deemed necessary, neither party anticipates that the other will have any reason to enforce at law the covenants to which he is committed, and each party is presumed to have full ability to judge of the consequences of his action.

Speaking generally, the points dealt with in chemists' service contracts are the names of the contracting parties ; the capacity in which the chemist is employed ; the period of the agreement ; the salary, working hours and holidays of the chemist ; his obligations as regards devoting his whole time to the service, carrying out instructions, promoting the success of the concern, making reports, etc. ; stipulations as to maintaining secrecy concerning plant, processes and business of a confidential nature ; the rights with regard to discoveries and improvements (patented or not) made by the chemist ; and certain restrictions upon the activities of the chemist after the expiry of the period of service.

Contracts also differ in the nature of the provisions made for their determination. In one form a chemist may be employed at a yearly salary without any stipulation as to the ending of the contract, or for a definite period of years at a

yearly salary, and thereafter from year to year subject to determination by a prescribed period of notice. If a period of notice is agreed upon no difficulty will arise as to the date of ending the contract, but if no period of notice be expressed the question may not be so easily settled.

In another form of contract the chemist is employed at a salary for a definite period without any provision as to the employment being continued on the completion of the term, although in many cases the employment is so continued by mutual agreement. In the opinion of the Committee it is desirable, in fairness to both parties, either to avoid this form of contract or to stipulate that formal notice of determination shall be given at a definite period before the completion of the term : if this be not done either party can cause the other great inconvenience by sudden withdrawal from what was expected to be a renewed agreement.

The question of notice should preferably be incorporated in the contract ; if it be not mentioned the matter will be governed by custom in the profession, evidence of which will be admitted by the Courts ; the onus of proving such custom will rest upon the party alleging its existence. If no such custom be proved it is for a jury to say what notice is reasonable in all the circumstances.

The Legal and Parliamentary Committee are not aware of any reported law cases, dealing with chemists, in this connection, and therefore cannot quote a precedent. It is their opinion that a reasonable notice should be, as a rule, three months. In view of the special nature of the functions of the chemist, it is not reasonable to expect either chemist or employer to be able to complete other arrangements in less than that period ; nor is it reasonable, on the other hand, to hold either party for a longer period where a determination of the contract is desired. From the contracts examined by the Committee it appears that although in individual cases there are variations, the average period of notice prescribed in chemists' contracts is three months, but it may on occasion

be shorter for less experienced members of the profession and longer where men of considerable experience are concerned.

In cases where employment has extended beyond the limit set out in the contract the question arises as to what period of notice is required to determine the employment. If the original contract expressly stated that employment was to continue at the end of the term subject to a prescribed period of notice the matter is of course clear ; if the original contract contained no such stipulation, but did contain a clause with regard to the period of notice, the employment will still be governed in all respects by the covenants in the original contract ; if, however, there be no stipulation as to period of notice the matter will be settled by custom or as in the foregoing paragraphs.

A closely allied matter is the question as to the period for which a chemist is engaged if the contract is silent in that respect. The matter is decided at common law by the proposition that, in the absence of circumstances showing an intention to the contrary, hiring will be presumed to be yearly hiring, and cannot be terminated before the end of a year of service. In practice, however, other circumstances, which may be deemed to show an intention to the contrary, are so frequently present that no such precise rule can be laid down ; each case must be considered by itself. For example :—

- (1) The circumstance that salary is paid monthly is, if no other considerations arise, strongly in favour of the view that the hiring was for a month, but
- (2) A chemist being a man on whose education considerable capital has been expended, it is highly improbable that he would consent to very short terms of engagement.
- (3) Custom often governs the matter ; thus it has been held that editors, reporters, surgeons, and an engineer to a canal company are yearly servants.
- (4) Service for more than a year, without an express contract of hiring or under a contract, but for no definite period may be evidence of a yearly hiring.

The following are some of the broad legal principles which govern the relations of every master and servant whether they be specifically indicated in the contract of service or not :—

The employee is required faithfully and diligently to serve the employer in the stipulated capacity and to endeavour to promote the success of his employer's business to the best of his ability ; this needs little comment. The employee is bound to be reasonably diligent, and he may be dismissed for habitual neglect of his duties. He is bound to act with good faith and consult the interests of his employer, and may be dismissed for misconduct injurious thereto, even though such misconduct do not relate to the particular duties.

The employee is usually required to devote the whole of his time and attention to the business of the employer and the duties of his office. In a case which went to the Court of Appeal (*Whitwood Chemical Co. v. Hardman*) a chemist had agreed to give the whole of his time to the plaintiffs as manager, but he devoted his spare time to promoting the interests of a somewhat similar company on whose Board he was asked to serve as a director. The Court refused to restrain him from so doing. In explanation of this decision, it should be remarked that an agreement for service cannot be specifically enforced by the Courts, so that if an employee is improperly dismissed and forced to apply to the Courts for remedy, apart from the question of mutual agreement, his only remedy is to obtain damages. On the other hand, if the employee refuse to carry out his contract the employer cannot force him to do so, though the latter can obtain damages against the former ; but what the Courts will not do directly they may by injunction effect indirectly ; so that if a contract of service contains a positive agreement to do something and a negative agreement not to do another, though they cannot enforce the positive agreement, they can restrain the breach of the negative agreement. In the circumstances, therefore, if it is desired that the chemist shall, in fact, devote all his professional energies to the work of his employer, a definite negative covenant should be included to the effect that he shall not

during his term of employment be engaged directly or indirectly in any other trade, business, or employment without the consent of his employer.

The employee must perform all such services as may be required and carry out all lawful orders of his employer, and he may be dismissed without notice for wilful disobedience of such orders. On the other hand, an employee may not be dismissed if he refuse to perform services of a kind which he did not undertake to perform. It matters not how inconvenient to the employee nor how harsh the orders may be—provided they are lawful and within the scope of his employment—he must obey on pain of dismissal.

Employers have been held to be warranted in dismissing employees for disclosure of the employers' trade or business secrets, for disclosure of the accounts of a company to a person connected with another company, and for the secret receipt by a managing director of commissions from companies with whom he contracted as agent for his employers. The Courts will restrain, often with damages, the publication to the prejudice of the employer of information acquired during an employee's term of service. In many of these matters a chemist stands in an exceptionally privileged position for the acquisition of such secret knowledge, and although, in the words of Mr. Justice Astbury, "A man's aptitude, his skill, his dexterity and his manual or mental ability . . . are not his master's property, they are his own . . ." and, therefore, although he is entitled to the enhanced value of his professional knowledge, no employee is justified in using or publishing knowledge or information as to his employer's business. For instance, a process or a particular piece of apparatus used in a certain factory may actually be described in the literature, but a chemist is not allowed without permission to disclose that this particular process or apparatus is used in the factory where he is or has been employed.

In a similar manner an employee cannot use in a future employment confidential information obtained in the course of the late employment, *i.e.* such information as relates to the

business connections, or the secret (unpublished) processes—of his late employer, or the results of (unpublished) researches carried out by himself or his predecessors or immediate colleagues in such employment.

Inasmuch as contracts of service are not assignable the assignment by the employer of his whole business and all contracts connected with it, operates as a wrongful dismissal of the employee, if the latter desires to avail himself of the breach, and if the employer is a Company, a compulsory winding up order or the appointment by the Court of a Receiver, or a voluntary winding up order coupled with notice to the employee that the business will be discontinued, amounts to a dismissal for which the employee may claim damages.

These are all matters of general law which are frequently included in service agreements, since ignorance of them or inattention to them may lead to a breach of contract. It is necessary to add that a master is not bound to give a valid reason for dismissing his servant ; it is sufficient if a valid reason in fact exist, but it is for the jury to say whether the facts alleged do constitute a valid reason.

On account of the confidential nature of his employment a chemist is frequently called upon to assent to a covenant restraining his right to practise in a certain branch of the profession, subject to specified limits as to time and place. This covenant was fully dealt with in the Journal 1920, pages 326 to 329. It must be emphasised that such covenants must be supported by good consideration, and that the restraint must not extend further than is necessary to protect the reasonable rights of the employer in the particular circumstances in question. The general clauses of a service agreement cannot be assigned, since the contract is a personal matter between employer and employee, but a covenant in restraint of trade may be enforced by the assignees of the employer save where it is of a purely personal character. A covenant of this nature cannot be enforced by an employer who has terminated the contract by wrongful dismissal. The amount of the damages for a breach of such a covenant is for

the jury to assess. The parties may, however, actually agree that in the event of a breach the one shall pay to the other a specified sum, but unless expressly stated it is not infrequently a matter of difficulty to decide whether such a sum is by way of penalty, i.e. a sum named to secure performance of the contract, not an agreed valuation of the consequences of a breach, i.e. liquidated damages. If the Court considers the sum a penalty only the actual damage sustained can be recovered, though an injunction also may be granted.

It is usual and desirable, where it is intended that an employee shall be restrained from practice, for the employer to agree to continue to pay a definite proportion of salary during any period of enforced idleness, or alternatively to agree to the further employment of the employee during such time. In this connection, and also when suing for wrongful dismissal, it is necessary to bear in mind that the employee is bound to make reasonable exertion and show diligence in endeavouring to obtain other employment. In estimating the damage he has suffered he will be deemed to have earned what he might have earned if he had been diligent in seeking other employment.

In chemists' contracts it is commonly covenanted that in the event of any improvements or inventions being made by the employee during his term of service they shall be communicated to the employer, and any patents that may be taken out for them shall be the sole and absolute property of the employer. Having regard to the nature of the duties of a scientific and technical employee, such as a chemist, his opportunities and qualifications for getting an insight into confidential matters, and the special knowledge he is properly expected to bring to bear upon his work, these stipulations are, in the great majority of cases, reasonable. It is difficult to see how any chemist, even if his duties be of a routine character, can fulfil his common-law obligations of diligent and faithful service and of secrecy otherwise than by full disclosure to his employer (and to no one else, except with his employer's permission) of any improvements or inventions he may make. Sometimes

it is expressly agreed that the employee is to receive additional (though unspecified) remuneration, at the discretion of the employer, in respect of such of the employee's inventions or the like as are taken up and worked by the employer. Except in very unusual cases—such as where a chemist is engaged specifically to invent a process for manufacturing a particular material—it is impracticable to specify a definite basis of remuneration, and this matter has to be left to the good sense of the employer, who, as a business man, will naturally be anxious that a chemist who has proved his worth will be contented with his employment. A chemist who has shown originality and ability by making discoveries is generally marked out for special advancement.

It is desirable to specify in the contract that, despite any extra remuneration, the contract will subsist, since otherwise it might be possible to rescind for a technical breach of contract by reason of the extra payment.

It should be borne in mind that even if the service agreement contains no express covenant to give to the employer the benefit of discoveries, etc., made by the employee, there may nevertheless be an implied contract to that effect. Thus in the case of the manager of an engineering company, whose agreement contained no such covenant and who took out certain patents, it was held that owing to the nature of the relations between the parties he was not entitled to the benefit of the patents (*Worthington Pumping Engine Co. v. Moore*). The judge said: "I recognise and quite appreciate the principle of those cases which have established that the mere existence of a contract of service does not *per se* disqualify a servant from taking out a patent for an invention made by him during his term of service . . . but, on the other hand . . . it is clear that the circumstances must be considered in each case. I consider that, bearing in mind the principles laid down in the authorities to which I have referred, it is impossible to say in the present case that the defendant has established the right he claims, having regard to the obligations to be implied arising from his contract of service, and I am of opinion that

his case is inconsistent with an observance of that good faith which ought properly to be inferred or implied as an obligation arising from his contract."

The Contract should indicate the salary which it is intended shall be given throughout the term, and a clause should also define the extent of holiday. The amount of holiday will largely depend upon the character and responsibility of the work involved.

The termination of a contract is effected—

- (a) By mutual consent.
- (b) By expiration of the period of service.
- (c) By notice or payment of salary in lieu of notice.
- (d) By dismissal, or departure without notice, for good cause.
- (e) By impossibility of service, e.g. through the death of one of the parties.

Finally, it is important to remember that Service Contracts are liable to Stamp Duty. The Contract must be stamped (6d.) within fourteen days of its signature, and in the case of a contract with a company, under Seal, a ten-shilling stamp is required. No contract which is not properly stamped will be admitted in the Courts as evidence, and in the case of omission to stamp a contract a heavy penalty is payable.

April Examinations.

Examinations were held during the week commencing April 11th, 1921, at the places given below :—

General Chemistry—for the Associateship, at the Institute.

Branch (d) Organic Chemistry—for the Associateship, at the Institute, and at the Royal Technical College, Glasgow.

Branch (e) The Chemistry (including Microscopy) of Foods and Drugs, and Water—for the Fellowship and the Associateship, at the Institute.

An Examination in Branch (d) Organic Chemistry was also held in the University of Otago, New Zealand, during the week commencing February 14th.

Nine candidates presented themselves; the number examined in each branch and the number of those who passed are shown in the following table :—

	NUMBER EXAMINED.	NUMBER PASSED.
General Chemistry, for A.I.C.	3	2
Branch (d) Organic Chemistry :		
For A.I.C.	3	3
Branch (e) Chemistry, including Microscopy of Foods and Drugs, and of Water :		
For A.I.C.	2	1
For F.I.C.	1	0
	—	—
	9	6

In the case of one candidate in General Chemistry the Board recommended that when he presents himself again he be not required to take the practical part of the Examination.

The following Candidates satisfied the Board :—

For Associateship.

Birkitt, Cyril Herbert	General Chemistry.
Boyes, George Richardson	Branch (e)
Byron, John Percy	„ (d)
Carter, Charlie Lyons	„ (d)
Macaulay, Robert Milroy	„ (d)
Taylor, Henry Frankland	General Chemistry.

The practical work of the successful candidates was satisfactorily carried out. The examiners report, however, that as a rule the candidates did not write up their notes as the work proceeded ; in consequence the experimental record was hurriedly put together at the end of the day.

The Examiners also remark that in general the translation of German technical literature into English was not altogether satisfactory ; although in most cases a reasonably accurate translation was produced, it was clear that the candidates would not refer to German literature as a matter of routine.

Examination for Associateship in General Chemistry.

MONDAY, APRIL 11th, 1921, 10 a.m. to 1 p.m.

(Only six questions to be attempted.)

1. Mention the principal ores of copper and describe the metallurgical processes involved in obtaining the metal from them.

2. Give a brief outline of the resemblances and differences between the chemical properties of Iron, Cobalt, and Nickel, and show the relation of these elements to their neighbours in the Periodic System. How may pure salts of nickel and cobalt be obtained ?

3. Describe the lead chamber and contact methods for the preparation of sulphuric acid. In what respect has the latter the advantage ?

4. Describe the separation of pure thorium and pure cerium from Monazite.

5. State Graham's Law of diffusion, and show how it may be deduced from the Kinetic Theory of gases.

6. Give a general account of the methods used for the determination of atomic weights.

7. Describe how the Phase Rule has been applied to the study of alloys of two metals.

8. Discuss the influence of Cannizzaro on the development of modern chemical theory.

2 to 5 p.m.

(Only six questions to be answered.)

1. Give an account of the amino-acids showing how they have been utilised in the preliminary steps to the synthesis of an albumen.

2. On what grounds is the usually accepted structure of naphthalene based ?

3. Describe with experimental details Skraup's method of synthesising quinoline and show the part played by the reagents employed. What oxidising agents may be employed in this synthesis?

4. Give an account of the Stereo-chemistry of unsaturated compounds as shown by substances containing either (1) the $C=C$ or (2) $C=N$ groups.

5. Describe briefly the investigation of the structure of indigo and the researches which led to the synthesis of this dyestuff on the commercial scale.

6. Describe the chief uses in synthetic organic chemistry of either (1) the Grignard reaction, or (2) the Diazo-reaction.

7. Describe the synthesis of one of the following compounds (1) Nicotine, (2) Camphoric Acid, (3) Adrenaline, (4) Uric Acid.

8. Give an account of the use of metals as catalysts in organic chemistry.

TUESDAY, APRIL 12th, 1921 ; 10 a.m. to 4.30 p.m.

1. Make a complete analysis of the sample of Barium Peroxide supplied (A).

(This exercise may be completed on Wednesday.)

WEDNESDAY, APRIL 13th, 1921 ; 10 a.m. to 4.30 p.m.

1. Complete the analysis of the Barium Peroxide.

2. Analyse qualitatively the mixture of inorganic substances (B) which contains four metals and two acid radicles.

$[Ba(NO_3)_2, Ca(NO_3)_2, CuCl_2, HgCl_2.]$

THURSDAY, APRIL 14th, 1921 ; 10 a.m. to 4.30 p.m.

1. Estimate the glucose in the sample (A) supplied using volumetric and polarimetric methods. ($C_6H_{12}O_6$, H_2O .)

(This exercise may be completed on Friday.)

FRIDAY, APRIL 10th, 1921 ; 10 a.m. to 4.30 p.m.

1. Complete the analysis of the sample of glucose.

2. Separate the two components of the mixture (B) of organic compounds. Prepare derivatives of each component and determine their physical constants. (β -naphthol and β -naphthylamine.)

Branch (d)—Organic Chemistry.

MONDAY, 11th APRIL, 10 a.m. to 1 p.m.

1. Describe in detail a method for the preparation of phthalic anhydride and indicate the chief industrial uses of this substance.

2. Write a short essay on the molecular conditions which are considered to determine the presence of colour in an organic compound.

3. Illustrate the chief differences which influence the preparation of an organic derivative of industrial importance in the laboratory and on the large scale.

4. Glucose and many other sugars exhibit mutarotation. Define this phenomenon and describe how its occurrence has been explained.

5. Write a short essay on the chemistry of cellulose. Why has this substance been regarded as a possible starting point in the preparation of power alcohol?

TUESDAY, APRIL 12th, 1921 : 10 a.m. to 4.30 p.m.

1. You are required to hydrolyse the given ester (*a*) and to prepare pure specimens of both acid and alcohol. The melting point or boiling point of each should be recorded and specimens left for inspection. (Salol.)

2. Assign substance (*b*) to its class, and, if possible, identify it. (m-nitrobenzoic acid.)

WEDNESDAY, APRIL 13th, 1921 : 10 a.m. to 4.30 p.m.

1. Substance (*c*) is a crude hydrocarbon; you are required to prepare from it (1) a specimen of the pure hydrocarbon, (2) an oxidation product and (3) a picrate. In all cases crystalline specimens should be left for inspection and the melting points determined. (Acenaphthene.)

THURSDAY, APRIL 14th, 1921 : 10 a.m. to 4.30 p.m.

1. From the aqueous solution of the formic acid provided (*d*) you are required to prepare (1) a sample of the pure acid, (2) the ethyl ester.

2. Investigate the substance (*e*) (Bismuth tribromphenol.)

FRIDAY, APRIL 15th : 10 a.m. to 4.30 p.m.

From the aromatic primary amine provided (*f*) prepare about 20 grams of the iodo derivative of the hydrocarbon in a pure condition. (p-toluidine.)

Branch (*c*)—The Chemistry (including Microscopy) of Foods and Drugs, etc.

MONDAY, APRIL 11th, 1921 : 10 a.m. to 1 p.m.

NOTE.—Candidates are required to answer the questions in Part I. and Part II. in separate books.

PART I.

1. Write an account of the methods prescribed in the British Pharmacopoeia for the estimation of arsenic in drugs.

Give the maximum permissible Pharmacopoeial limit for the proportion of arsenic in any three drugs.

2. What means are available for the analytical distinction between animal and vegetable oils? Discuss the limitations of the processes you describe.

3. What authoritative body has in recent years proposed standards for the purity of sewage effluents? What are the standards proposed? and describe in detail the analytical methods applied to determine conformity or otherwise with these standards.

4. Burettes, measuring flasks, etc., used in volumetric analysis are customarily standardised on one of two systems. State what these two systems are.

A liquid whose specific gravity is 1.021 is found to contain 2.42 per cent. by weight of a certain ingredient. Express this result in grains per pint.

PART II.

1. Compare hydrocyanic acid and aniline as poisons, both as to their mode of action and the symptoms produced. State how you would identify both these substances in the contents of a stomach.

2. Enumerate the official preparations of nux vomica and opium. Give a list of the active principles that have been obtained from these two drugs with their medicinal doses and the doses you would consider to be "poisonous."

3. Explain what in pharmacy is meant by "incompatibility." Mention any drugs or pharmaceutical preparations which would be incompatible with the following:—*Acidum hydrochloricum*; (b) *Strychninae hydrochloridum*; (c) *Potassii citras*; (d) *Sodii bromidum*; (e) *Acidum tannicum*; (f) *Zinci sulphas*.

MONDAY, APRIL 11th, 1921 : 2 to 5 p.m.

1. Identify the poison in solution A and make a slide and a drawing thereof showing crystals, which may be used as a test for the poison. (*Potassium Oxalate*.)

2. The sample of oatmeal B contains an alkaloid. Identify it and state whether it is present in sufficient quantity to be poisonous. (*Strychnine hydrochloride*.)

3. Identify the microscopical preparations on the slides numbered 1 to 6. (Human hair, wool fibre, cotton fibre, silk, fresh potato starch, haemin crystals.)

TUESDAY, APRIL 12th, 1921 : 10 a.m. to 4.30 p.m.

1. Determine the percentage of ammonia present as ammonium salts in the fertiliser provided (lawn sand).

2. Identify the two substances which, in the given liquid, are in solution in alcohol.

From the liquid prepare a pure specimen of an organic acid and leave a specimen of this acid deemed sufficient, and in a fit state, for the determination of its melting point and its neutralisation value. (*Phenol and methyl salicylate dissolved in alcohol*.)

WEDNESDAY, APRIL 13th, 1921 : 10 a.m. to 4.30 p.m.

1. Determine the melting point and the neutralisation value of the specimen of organic acid prepared yesterday.

2. Identify as many as possible of the substances A to H. All are single substances ; E to H are in aqueous solution :—

A. Saccharin.	E. Glycerine.
B. Chloroform.	F. Gelatine.
C. Tartaric acid.	G. Formaldehyde.
D. Acetone.	H. Acetic acid.

For A.I.C. candidates only.

3. Examine and report upon the sample of ammoniated tincture of quinine (weak in Ammonia).

For F.I.C. candidates only.

4. Examine the sample of lime juice provided and determine the nature and amount of preservative present, if any.

Apart from the question of preservatives, do you consider this a genuine lime juice. (An artificially coloured solution of citric acid with sulphite as a preservative.)

THURSDAY, APRIL 14th, 1921 : 10 a.m. to 4.30 p.m.

1. Determine the behaviour of the given water towards permanganate in acid solution. Choose your own conditions. (London tap water.)

For A.I.C. candidates only.

2. Examine and report upon the sample of cheese provided. (Normal full-cream cheese.)

For F.I.C. candidates only.

3. Examine the sample of flour provided with a view to the detection and estimation of foreign substances.

Determine the percentage of phosphorus in it. (Wheaten flour, maize, potassium persulphate.)

FRIDAY, MARCH 15th, 1921 : 10 a.m. to 4.30 p.m.

1. Determine the percentage of alcohol in the given liquid. (Spiritus camphorae B.P.)

2. Determine the percentage of "ash" in the milk provided. Do you consider the ash a normal one ? (Milk containing 10% of added water and 0.1% of added sodium chloride.)

3. Identify microscopically the specimens A to F. Determine by measurement the average size of the starch granules in C.

A. Cocoa shell powder.	D. Ground date stones.
B. Oatmeal.	E. Penicillium.
C. Ground rice.	F. Apple pulp.

TRANSLATIONS.

Candidates were required to translate French and German technical literature into English. The passages given in the foregoing examinations were :—

FRENCH.

Chimie et Industrie,

Vol. IV., No. IV., page 490.

Procédé rapide de dosage du titane, etc.

Vol. IV., No. V., page 65.

Modification à la méthode à la phenylhydrazine.

Vol. IV., No. 2, page 198.

Marche de l'analyse en présence de l'acide phosphorique.

Vol. V., No. 3, page 289.

Nouveau procédé pour le dosage du soufre dans les petroles.

Vol. V., No. 2, page 163.

La détection de l'arsenic.

Vol. II., page 788.

Distillation des huiles hydrocarburées.

Vol. I., page 310.

Procédé pour la preparative des vitamines épurées.

GERMAN.

Ber. 1921 : 54, 439 : II. Sulfonsäuren, Part I.

Ber. 1920 : 53, 2041 : 2,6-Dibrom-p-nitranilin (VI.) (whole para.)

Ber. 1921 : 54, 9 : Darstellung von Tribrom-isopentan (as far as "Produkt").

Ber. 1913 : 1, 217 : II. Die Verbrennung von Diamant in Sauerstoff.

Ber. 1913 : 46, 17 : Richard Meyer (whole paragraph).

Report of the 7th International Congress of Applied Chemistry,
Section V., page 307 :

Ueber die Bestimmung des Invertzuckers in Ruben (as far as "verfügen").

Report of the 7th International Congress of Applied Chemistry,
Section VIb, page 62 :

Hochkarburiierter Spiritus als Motortreibmittel (as far as "der Landwirtschaft gelegen ist").

Branch (d).—Organic Chemistry.

MONDAY, FEBRUARY 14th, 1921 (in New Zealand): 10 a.m. to 1 p.m.

1. Describe, with all necessary experimental details, the course of the reactions which take place in the Perkin synthesis of unsaturated aromatic acids.

2. Indicate the manner in which hydrogen in the presence of catalysts has been utilised for the preparation of organic substances of commercial importance.

3. Discuss the chemistry of the oximes with special reference to the stereoisomerism exhibited by certain members of the series.

4. Describe the methods used for the isolation of anthracene from coal-tar and illustrate the industrial importance of the chief derivatives of this hydrocarbon.

5. Give an account of the present position of our knowledge respecting the chemical constitution of rubber.

TUESDAY, FEBRUARY 15th, 1921 : 10 a.m. to 4.30 p.m.

1. Prepare about ten grams of the acetate of the hydroxy derivative A in a state of purity suitable for analysis.

(β -naphthol.)

2. Analyse qualitatively the mixture B.

(Uric Acid, Sodium Acetate, Maltose.)

WEDNESDAY, FEBRUARY 16th, 1921 : 10 a.m. to 4.30 p.m.

1. Estimate the percentage of acetyl in the acetyl derivative prepared yesterday.

2. C and D are commercial samples of intermediate products employed in the manufacture of dyestuffs. You are required to identify the compounds and to report on the impurities present.

(C was R-salt ; D was p-nitraniline.)

THURSDAY, FEBRUARY 17th, 1921 : 10 a.m. to 4.30 p.m.

1. E is an aqueous solution of acetone and methyl alcohol. You are required to determine the amount of acetone and of methyl alcohol present in the solution.

(*This exercise may be finished to-morrow, if necessary.*)

2. Identify the substance F. Prepare a crystalline derivative and determine its melting point. (Malonamide.)

FRIDAY, FEBRUARY 18th, 1921 ; 10 a.m. to 4.30 p.m.

1. Complete exercise 1 (yesterday's paper).

2. P is an alkaline solution containing the products of hydrolysis of an ester. You are required to (a) isolate from the solution a pure sample of the alcohol and of the acid, (b) determine the boiling point of the alcohol and the melting point of the acid and to leave a specimen of each for inspection. (10 gms. of propyl alcohol and 20 gms. of benzoic acid dissolved in 100 cc. of 20 % aqueous KOH.)

Books and their Contents.

[* Books presented by the authors or publishers to be seen in the Library of the Institute.]

"Bio-Chemistry." Benjamin Moore. Pp. vii. and 340.
(London : Edward Arnold.) 21s.

Biotic structure and biotic energy ; life and light ; photo synthesis ; inorganic iron compounds in ploroplasts ; formation of nitrites from nitrates ; action of light on organic compounds ; chemical transformation in living matter ; velocity of reaction and influence of other factors upon enzymes and cells ; catalysts and enzymes ; secretion and glandular mechanisms ; colloid and crystalloid cells.

"Cellulose Esters, Technology of." E. C. Warden. Vol I.
(in five parts). Pp. cccclxxvi. and 3709. (London :
E. & F. N. Spon.) £10 10s.

Cellulose ; starch ; cotton ; preparation of cotton for esterification ; nitric acid ; sulphuric acid ; mixed acids ; acid tables ; nitrocellulose theory ; nitration of cellulose ; analytical determinations of the cellulose nitrates ; historical development of the cellulose esters.

"Chemical Solubilities, Dictionary of": Inorganic. 2nd
edition. A. M. Comey and D. A. Hahn. Pp. xviii. and
1139. (New York : The Macmillan Company.) 72s.

*"Chemists' Year Book." 2 vols. Edited by F. W. Atack,
assisted by L. Whinyates. Pp. 1142. (Manchester :
Sherratt & Hughes.) 21s.

"Colloids, The Formation of." T. Svedberg. Pp. viii. and
127. (London : J. & A. Churchill.) 7s. 6d.

Formation of disperse systems in vacuo ; in gases ; in liquids and in solids.

"Dairy Bacteriology." Orla Jensen, translated by P. S.
Arup. Pp. xii. and 180. (London : J. & A. Churchill.)
18s.

Part I. : General. Part II. : The normal and abnormal microflora of milk ; preservation of milk and its treatment for consumption ; applications of lactic acid fermentation ; butter ; the ripening processes of the different cheeses ; defects of cheese ; grading of milk.

"Electronic Conception of Valence and the Constitution of Benzene, The." Monographs on Inorganic and Physical Chemistry. H. S. Fry. Pp. xviii. and 300. (Longmans, Green & Co.) 16s.

Part I. : The electronic conception of valence. Part II. : The electronic formula of benzene ; substitution in the benzene nucleus. Part III. : Physical properties and physico-chemical phenomena : molecular volumes ; absorption of light and fluorescence. Part IV. ; Metal-ammines ; bibliographical review and general conclusions.

"Eminent Chemists of our Time." Benjamin Harrow. Pp. xvi. and 248. (New York : D. Van Nostrand Co.) 9s.

*"Explosives Supply, Technical Records of," 1915-18. No. 1 : Denitration of Spent Acids. Ministry of Munitions and Department of Scientific and Industrial Research. Pp. viii. and 56. (London : H.M. Stationery Office.) 12s. 6d.
Description of the process ; plant design and operation.

*"Factory Chemistry : Preparation to Courses in Metallurgy and Metallography." W. H. Hawkes. Pp. vii. and 59. (London and New York : Longmans, Green & Co.) 4s. 6d.

"Famous Chemists : The Men and their Work." Sir William A. Tilden. Pp. xx. and 296. (London : George Routledge & Sons.) 12s. 6d.

Robert Boyle ; the Phlogistians ; the anti-Phlogistic revolution ; electricity in the service of chemistry ; laws of combination and the atomic theory ; electro-chemistry ; molecule and atom defined ; early attempts at classification ; theories of chemical action and constitution of molecules ; classification and nature of elements.

* "Gretna, H.M. Factory : Description of plant and processes." J. C. Burnham, C.B.E., C.S.I. Pp. x. and 218. (H.M. Stationery Office : J. Maxwell & Son, Dumfries.)

*"Industrial Alcohol Committee, Report of," 1920. (Government Central Press, Simla.)

"Inorganic Chemistry, Text-Book of." J. Newton Friend. Vol. IX., Part II. Pp. xxv. and 265. (London : Charles Griffin & Co., Ltd.) 18s.

Iron and its compounds.

"Laboratories : Their Planning and Fittings." A. E. Munby.

Pp. xx. and 220. (London : G. Bell & Sons, Ltd.) 25s.

Scope and inception of building schemes ; the requirements of chemistry ; the requirements of physics ; the requirements of biology and geology ; laboratory services ; recent school designs ; recent designs for advanced work ; recent foreign designs.

"Laboratory Glass Blowing, Notebook of." B. D. Bolas.

Pp. vi. and 106. (London : George Routledge & Sons.)

3s. 6d.

"Metallography." Part I. : Metals and Common Alloys.

Samuel L. Hoyt. Pp. ix. and 462. (New York : McGraw Hill Book Co., Inc.) 28s.

Pure metals ; white metal alloys ; light metal alloys ; brasses and bronzes ; steel and cast iron ; special steels.

"Microbiology." C. E. Marshall. 3rd edition. Pp. xxviii.

and 1043. (London : J. & A. Churchill.) 21s.

Morphology and culture of microorganisms ; physiology of microorganisms ; nutrition and metabolism ; physical influences ; chemical influences ; mutual influences ; applied microbiology of air, of water and sewage, of soil, of milk, of milk products, of foods, of alcoholic fermentation and derived products, of special industries, of the diseases of men and domestic animals ; microbial diseases of plants.

"Microscopy, Critical." A. C. Coles. Pp. viii. and 100.

(London : J. & A. Churchill.) 7s. 6d.

Manipulation of the microscope and its accessories.

*"Modern Chemistry, Pure and Applied." A. J. Hale.

2 vols. Pp. vii. and 272, viii. and 276, and tables.

(London : Virtue & Co.) 15s. each vol.

Vol. I. : Composition of air and water ; atomic theory and laws of chemical change ; sulphur, selenium, tellurium ; chlorine group of elements ; nitrogen, phosphorus, arsenic ; carbon and its compounds ; silicon, boron and their compounds. Vol. II. : Alkali metals and their compounds ; properties of dissolved substances ; metals of the alkaline earth group and their compounds ; velocity of chemical change ; equilibrium : aluminium group of metals ; rare earth elements, titanium and zirconium ; inert gases of the atmosphere, radio-activity.

“Perfumes, Essential Oils and Fruit Essences.” Monographs of Chemical Technology, X. Geoffrey Martin. Pp. vii. and 138. (London: Crosby Lockwood & Son.) 12s. 6d.

Characteristics and classification; manufacture; essential oils and other vegetable perfuming substances; animal, artificial and synthetic perfuming substances; artificial fruit essences and esters; tinctures, extracts; blending; recipes; analysis.

“Reagent Chemicals, Standards and Tests for.” Benjamin L. Murray. Pp. vi. and 385. (New York: D. Van Nostrand Co.) 18s.

“Steel, Case Hardening of.” H. Brearley. Pp. xi. and 207. (London: Longmans, Green & Co.) 16s.

Cementation; structural changes in the core; properties and defects of hardened cases; carburising operation; case hardening steels; carburising reagents; methods of testing; automobile steels; hardening and tempering; surface hardening without cementation.

“Tanning Materials, with notes on Tanning Extract Manufacture.” A. Harvey. Pp. ix. and 182. (London: Crosby Lockwood & Sons.) 15s.

Tanning materials; manufacture of tanning extracts; methods of examination; miscellaneous.

CORRIGENDUM.—In the Journal, Part II., the book on *Silica and the Silicates*, by J. A. Audley, should have been entered and marked (*) as presented by the author.

Obituary.

BERTRAM BLOUNT died at 48, Bedford Gardens, Kensington, on April 9th, in his fifty-fifth year.

Educated at King's College School, he matriculated in the University of London, and received his training under Prof. Bloxam at King's College, where he was Daniell Scholar in 1885. After holding an appointment for about a year as chemist to the Bullion and Metal Refinery Co., he became chief chemist at the Chemical Laboratory and Testing Works of Mr. W. H. Stanger, with whom he subsequently became partner, at Broadway, Westminster. At about the same time he was appointed chemist to the Crown Agents for the Colonies. From the earliest stages of his career he paid special attention to the chemistry of Portland Cement, but his practice, which he continued independently after the death of Mr. Stanger, included a wide range of work covering materials of construction and engineering generally. He was the joint author with Mr. Arthur G. Bloxam of *Chemistry for Engineers and Manufacturers*, and with Messrs. W. H. Woodcock and Gillett of a monograph on *Cement*. On the same subject he contributed articles to the *Encyclopædia Britannica* and to *Thorpe's Dictionary of Applied Chemistry*, and delivered, before the Institute, two lectures, which were subsequently published and issued to the members and students. He was also editor of a series of books on Electro-Chemistry, in course of publication at the time of his death.

In 1903 he was elected as representative of the Institute, and rendered valuable service, on a Sub-Committee of the British Engineering Standards Committee, appointed to deal with the question of the standardisation of cement tests. He also gave evidence, on behalf of the Institute, before the Treasury Committee appointed in 1906 to enquire into the working of the National Physical Laboratory, so as to avoid undue interference with the business of other agencies. In the early days of the war he was very active in an endeavour to bring cotton within the category of contraband goods.

He became an Associate of the Institute in 1888, and a Fellow in 1891; served as a Member of Council for two periods (1903-06, 1911-14), and as Examiner in General Chemistry and Mineral Chemistry from 1907-11. At his funeral, the Institute was represented by Mr. Frank W. Harbord.

ALEXANDER WYNTER BLYTH died on April 1st in his seventy-seventh year. The son of a medical practitioner, he was born at Woolwich, trained in medicine and chemistry at King's College, London, and qualified as M.R.C.S. (Eng.) in 1870. He practised in

medicine at Worcester for several years before he was appointed Public Analyst for Totnes, for the County of Devon, and the Borough of Tiverton. He was associated, from its inception, with the Society of Public Analysts, of which he was three times a vice-president, frequently contributing papers to *The Analyst*. Later he came to London as Medical Officer of Health and Public Analyst for the Borough of St. Marylebone. He was associated in the foundation of a journal entitled *Public Health*, of which he was for some years editor, and contributed many papers to scientific societies on sanitary science and the chemistry of food and drugs. He was the author of *Foods; Their Composition and Analysis*, Sixth Edition (1909), and of *Poisons; Their Effects and Detection*, Fifth Edition (1921). He was called to the Bar as a member of Lincoln's Inn. He was elected a Fellow of the Institute in 1887, and served for two periods as a Member of Council.

JAMES EDWARD JOHNSON JOHNSON died at Forest Gate on April 1st, in his sixty-fourth year. Trained at Finsbury Technical College, under Professors Armstrong and Meldola, Ayrton and Perry, he became engaged as managing partner and chemist, in 1880, in the manufacture of pure acetic acid, acetates, &c., at the Crown Chemical Works, Stratford, with which he had previously been associated since 1872, and where he remained until his retirement in 1907. He was also connected with the manufacture of Edme Patent Yeast, and of Tuson's Disinfectant. He was elected a Fellow of the Institute in 1888.

Information has lately been received of the death of GEORGE JOYNSON, a Registered Student of the Institute, who was killed in action at the Battle of Loos. Born in 1887, he was trained at the Municipal School of Technology, Manchester (1902-1905), obtaining the Associate-ship of the School in Applied Chemistry and passing the Intermediate Science Examination of London University. At the time of his registration was working with Mr. John C. Platts, at Wilmslow. Subsequently, he was engaged in the laboratory of the Openshaw Works of Sir W. G. Armstrong, Whitworth & Co., Ltd., but soon after the outbreak of war, enlisted in the Lancashire Fusiliers, and in July, 1915, was transferred as a Corporal to the Special Brigade, R.E. (Gas Services). He was buried at Becordel, near Albert. His name will be added to the Roll of Honour of the Institute.

HERBERT YABSLEY LORAM died on March 23rd, 1921, at the age of 74 years. He was a student at the Royal College of Chemistry in 1870-71. He obtained an appointment as chemist at the Bede Copper Company, where he was engaged in the treatment of poor copper ores by lixiviation, and was afterwards Chief Assistant to Dr. Hassall in London before he became associated with John Grove Johnson. He was for over 40 years Chemist and Technical Adviser to Messrs. Johnson & Sons, Manufacturing Chemists and Assayers, specialising particularly in the analysis of metals, minerals and fuel, and in the manufacture of preparations of the precious metals. He was elected a Fellow of the Institute in 1878.

EDMUND JAMES MILLS died at Acton on April 21st, in his 80th year. Born in London, he was educated at the Grammar School, Cheltenham, and proceeded to his professional training at the Royal School of Mines. He graduated B.Sc. in 1863, and was awarded the doctorate in 1865. In 1861 he was assistant to Dr. John Stenhouse, and in the following year was appointed a demonstrator in chemistry in the University of Glasgow, where he continued until 1865.

In 1875 he was appointed, in succession to W. H. Perkin, senior, as Superintendent of the "Young's Laboratory" in Anderson's College, which was incorporated, in 1886, in the Glasgow and West of Scotland—now the Royal—Technical College, Glasgow, which position he held until his retirement with the honour of Emeritus Professor, in 1901. He was the author of numerous contributions to the *Proceedings of the Royal Society*, the *Transactions of the Chemical Society*, the *Journal of the Society of Chemical Industry*, etc., and of a book on *Fuel and its Applications*, written jointly with Mr. Rowans (1889), and *Destructive Distillation* (1877, 4th edition, 1892).

He received the degree of LL.D. from the University of Glasgow and was elected a Fellow of the Royal Society in 1874—was an Original Fellow of the Institute, a member of the first Council, a Vice-President (1904-07), and served as an Examiner for two periods (1883-87, 1888-92).

ISAAC SYDNEY SCARF died as the result of an accident on March 21st in his sixty-eighth year.

He was trained under Edward Frankland at the Normal School of Science, and was a science master in the City of London School from 1874 to 1919, and lecturer in chemistry and physics in the City of London College from 1883 until 1913.

He was elected a Fellow of the Institute in 1888.

CAPTAIN WILLIAM HENRY TEMPLEMAN died on March 11th, 1919, in his 36th year. Born on July 18th, 1883, he was educated at Hymer's College, Hull, and received his technical training at University College, London, and St. John's College, Cambridge, where he graduated with First Class Honours in Natural Science Tripos, and also as LL.M. He was for some time a Demonstrator at St. John's College, and later proceeded to Australia, where he was called to the Bar. Soon after the outbreak of war he returned to work under the Department of Explosives Supply, Ministry of Munitions, and was engaged at Waltham Abbey, Queensferry, and Gretna. In 1917, however, he proceeded to the Ordnance College, Woolwich, qualified as Inspecting Ordnance Officer, and was appointed Assistant to the I.O.O. Scottish Command. While occupying that position he attended courses at Heriot-Watt College, Edinburgh. At the time of the armistice he was engaged at the R.N. Ordnance Depot, at Crombie. He was elected an Associate of the Institute in 1918.

Changes in the Register.

At the meetings of the Council held on April 22nd, and May 28th, 1921, 4 Fellows were elected and 10 Associates were elected to the Fellowship; 52 Associates were elected; and 81 Students were admitted.

The Institute has lost 4 Fellows, 2 Associates and 1 Student by death.

New Fellows.

Briggs, John Frederick, A.C.G.I., 3, Hartington Street, Derby.
Lawrence, Henry William, Chemical Laboratory, Johnsonville, Wellington, New Zealand.
Singh, Bawa Kartar, M.A. (Cantab.), Professor of Chemistry, Government College, Lahore, Punjab, India.
Tuck, William Bradshaw, D.Sc. (Lond.), 45, Bartholomew Road, London, N.W.5.

Associates Elected to Fellowship.

Barber, Charles Douglas, B.Sc. (Lond.), 20, Champion Road, Upminster, Essex.
Day, Frank Edward, B.Sc. (Lond.), 4, The Trossachs, North Strand, Limerick.
Dixon, Stanley, M.Sc. (Sheff.), 300, Uttoxeter New Road, Derby.
Fairbourne, Arthur, B.A. (Oxon), M.Sc. (Mane.), 8, Victoria Road, Withington, Manchester.
Fearon, William Robert, M.A., D.Sc. (T.C.D.), Physiological Laboratory, Trinity College, Dublin.
Henstock, Herbert, M.Sc. (Viet.), Ph.D. (Zurich), Chemical Research Laboratory, School Gardens, Shrewsbury.
Higson, Geoffrey Isherwood, M.Sc. (Liv.), e/o The Institute of Chemistry.
Le Rossignol, Robert, 7, St. John's Road, Harrow, Middlesex.
Thole, Ferdinand Bernard, D.Sc. (Lond.), Meadhurst, Sunbury-on-Thames.
White, Gerald Noel, D.Sc. (Lond.), 7, Victoria Avenue, Worcester.

New Associates (by Examination).

Birkitt, Cyril Herbert, 21, Overdale Road, Derby.
Boyes, George Richardson, 61, Balham Hill, London, S.W.12.
Byron, John Percy, 7, Pavilion Road, West Bridgford, Notts.
Carter, Charlie Lyons, M.Sc. (Otago), Otago University, Dunedin, New Zealand.
Macaulay, Robert Milroy, 290, Paisley Road West, Glasgow.
Taylor, Henry Frankland, 299, Eccles New Road, Salford, Manchester.

New Associates.

Arnott, John, 14, Percy Street, Ibrox, Glasgow.
Bell, James, B.A. (Dub.), 30, Trinity College, Dublin.

- Biggs, Sidney Harold, 15a, Rockmount Road, Plumstead, London, S.E.18.
- Birkinshaw, John Howard. B.Sc. (Leeds), Maythorne, Ardrossan Road, Saltcoats, Ayrshire.
- Bonnell, Miss Jane, B.Sc. (Wales), Glan Rhys, Pwll, Llanelly.
- Booth, Alfred Lawrance, A.M.S.T., Hockerley House, Whalley Bridge, *via* Stockport.
- Brown, Andrew Charles, 26, Springvale Place, Saltcoats, Ayrshire.
- Cammack, Walter, B.Sc. (Lond.), Durley Grange, South Benfleet, Essex.
- Duerden, Richard Byron, B.Sc. (Lond.), Teniscliffe, Preston Old Road, Blackburn.
- Ewart, Herbert James, B.Sc. (Birm.), 16, Clarendon Road, Leeds.
- Farnell, Miss Gladys, B.Sc. (Lond.), 4, Blenheim Mount, Bradford.
- Farrar, Edward Kinder, A.M.C.T., 3, Stevenson Drive, Langside, Glasgow.
- Fraser, James Ross, A.C.G.F.C., 13, Archibald Road, Tufnell Park, London, N.7.
- Frew, Hugh Kilpatrick, 83, Siddals Road, Derby.
- Fullman, Benjamin, B.Sc. (Lond.), The University, Bristol.
- Funnell, William Stanley, M.A. (Toronto), 348, Davenport Road, Toronto, Ontario, Canada.
- Gander, Bernard Vincent, M.B.E., B.Sc. (Lond.), Sutton Valence School, Kent.
- Gosling, Frederick, 42, Shakespeare Crescent, Manor Park, London, E.12.
- Harding, Charles Thompson, B.A., B.Sc. (Lond.), 24, Mill Lane, Horwich, nr. Bolton.
- Haywood, Arthur, B.Sc. (Lond.), Cowley Boys' School, St. Helen's, Lanes.
- Herring, James Norman, 5, Kensington Gardens Square, Bayswater, London, W.2.
- Holden, Edmund Haworth, M.Sc. (Vict.), Springhill, Cloughfold, *via* Manchester.
- Ingham, George, B.A. (Oxon.), c/o Messrs. Kynochs Ltd., Umbogintwini, Natal, S. Africa.
- Jarman, John, A.R.C.S., 33, Prebend Gardens, Stamford Brook, London, W.4.
- Jones, Benjamin, B.Sc. (Wales), Post Office, Filton, Glos.
- Jordinson, Frank, B.Sc. (Leeds), 78, Bentley Street, Lockwood, Huddersfield.
- Knapp, Brian Russell, B.Sc., A.R.C.S. (Lond.), Hertcombe, George Road, Kingston Hill, Surrey.
- Ling, Edgar Robert, B.Sc., A.R.C.S. (Lond.), Loughborough College, Leicestershire.
- Macnair, Peter Mackenzie, B.Sc. (Glas.), c/o Mrs. McLeod, 25, Scotstoun Street, Scotstoun, Glasgow.
- Malkin, Thomas, B.Sc. (Lond.), Golden Square, Warrington.
- Martin, George, B.Sc. (Birm.), Sunnyside, 93, Upper Belgrave Road, Longton, Stoke-on-Trent.
- Newman, Herbert Samuel, B.Sc.Tech. (Manch.), Ivy House, Alderfield Road, Chorlton-cum-Hardy, Manchester.

- Nichol, Thomas Carrick, B.Sc.Tech. (Manc.), 12, Newton Road, Urmston, Manchester.
- Nicol, Hugh, 14, St. George's Road, Palmers Green, London, N.13.
- Rigg, Theodore, B.A. (Cantab.), M.Sc. (New Zealand), Cawthron Institute of Scientific Research, Nelson, New Zealand.
- Ross-Smith, Gerald Grant, A.R.C.S. (Lond.), 30, Craven Hill Gardens, London, W.2.
- Sewell, William Gawan, B.Sc. (Leeds), Colour Chemistry Department, The University, Leeds.
- Smith, Robert Christic, M.A., B.Sc. (Glas.), 25, Allan Park, Stirling.
- Strafford, Norman, B.Sc. (Lond.), 17, Delaunays Road, Crumpsall, Manchester.
- Taylor, Nathan, M.Sc.Tech. (Manc.), 245, Cheetham Hill Road, Manchester.
- Thompson, Leonard, M.Sc.Tech. (Manc.), 36, Palm Street, Slade Lane, Manchester.
- Thorne, Percy Cyril Lesley, M.A. (Cantab.), 40, Kidbrooke Park Road, Blackheath, London, S.E.3.
- Townend, Donald Thomas Alfred, B.Sc. (Lond.), 133, Mount Pleasant Lane, Upper Clapton, London, E.5.
- Urquhart, John Cramond, B.Sc. (Lond.), East Anglian Institute of Agriculture, Chelmsford, Essex.
- Watson, Arthur Frederick, B.Sc. (Lond.), 39, Guilford Street, London, W.C.1.
- Weighell, Arthur, 31, The Avenue, Consett, Co. Durham.

New Students.

- Abbott, Walter Edgar, 65, Hollybrook Road, Clontarf, Dublin.
- Alexander, James Dickson, 11, Wellington Street, Edinburgh.
- Allan, John, 189, St. Andrew's Road, Pollokshields, Glasgow.
- Anderson, James Thomson, 126, Lawford Road, N.B., Rugby.
- Andrews, Frederick William, 93a, St. Paul's Road, Camden Square, London, N.W.1.
- Banfield, Francis Harold, 40, Maryland Road, Wood Green, London, N. 22.
- Berchem, Rudolph Otto George Alexander, 3, Casewick Road, West Norwood, London, S.E.27.
- Blacktin, Samuel Cyril, 23, Walton Road, Sheffield.
- Boudry, Cyril, 23, Esplanade Place, Whitley Bay, Northumberland.
- Box, Ronald John, Elchester, Arthur Road, Slough.
- Breslin, John James, Royal College of Science, Dublin.
- Burns, James Alexander, 22, Townsend Place, Kirkealdy, Fife.
- Catchpole, Percival Arthur, St. Heliers, Masons Hill, Bromley, Kent.
- Challans, Frank Bertrand, 74, Plane Street, Hull.
- Clarkson, Ernest Lickiss, 2, South Avenue, Londesborough Street, Hull.
- Clements, George Stephen, 93, Durham Road, Plumstead, London, S.E.18.
- Cochrane, Henry Alfred, 25, Pretoria Road, Plaistow, London, E.13.
- Cohen, Harris, 54, Rahere Street, Goswell Road, London, E.C.1.
- Coulson, Alan George, 19, Gladwell Road, Stroud Green, London, W.8.
- Crawford, Aynsley, 5, The Hollies, Billingham, nr. Stockton-on-Tees.

- Curtin, Norman Richard, 29, Grove Park, Rathmines, Dublin.
- Dalton, William Geoffrey, 50, Moring Road, Tooting Bec Common, London, S.W.17.
- Davie, George Forbes, 102, Irvine Place, Aberdeen, Scotland.
- Edwards, Owen Kempster, 6, Dacre Park, Lee, London, S.E.13.
- Evans, Arthur Jack Sackville, 185, Maida Vale, London, W.9.
- Evans, Vivian Richard, 14, St. John's Road, Maindee, Newport, Mon.
- Fairclough, Fred, 20, Gordon Avenue, Bolton, Lancs.
- Farina, Philip Edward Lodovico, 8, Bettridge Road, Hurlingham, London, S.W.6.
- Farrell, Alfred Edmond, 37, Bellevue Road, Edinburgh.
- Forster, Claudius, 239, Westmorland Road, Newcastle-on-Tyne.
- Fulton, James Davidson, 63, King's Road, Beith, Ayrshire.
- Goldsmith, Eric Waller, Woolsthorpe Rectory, Grantham, Lincs.
- Goss, Frank Robert, 4, Abbotsford Road, Goodmayes, Ilford, Essex.
- Grayson, Harold John, 60, Broadwater Road, Tottenham, London, N.17.
- Greenwood, John, 38, Gordon Street, Abbey Hey, Gorton, Manchester.
- Griffiths, Albert Edward, 25, Meadowbank Crescent, Edinburgh, Scotland.
- Guinan, John Francis, 6, Lothair Street, Chorlton-on-Medlock, Manchester.
- Handley, Percy, Loughborough College, Loughborough, Leicestershire.
- Heather, Jack Rowan, 85, Lakeside Road, Palmers Green, London, N.13.
- Hendy, Reginald William, 45, Orchard Place, Blackwall, London, E.14.
- Hyland, John Laurence, 158, Mortlake Road, Ilford, Essex.
- Johnson, Bertrand Reaveley, The Hawthorns, Moss Lane, Pinner, Middlesex.
- Jones, Edgar, Milverton House, 167, Upper Dale Road, Derby.
- Lewis, Alkin, 74, Sutherland Avenue, Maida Vale, London, W.9.
- Matthews, Samuel, 46, Glenroy Street, Cardiff.
- McCaffery, Brian James, Royal College of Science for Ireland, Dublin.
- McCurdie, Thomas, 20, Torrens Square, Romford Road, London, E.15.
- McDougall, Alan Cameron, Iona Villa, Hunter's Quay, Argyllshire.
- Milne, Leslie Burt, 27, Warren Road, Wanstead, London, E.11.
- Mitchell, Robert Edward, 41, Park Parade, Harlesden, London, N.W.10.
- Mort, Albert Victor, Frondeg, Mynyddbach, Landore, Swansea.
- Myer, Edward, 51, Oxford Street, Liverpool.
- Orr, Andrew Picken, 22, Portland Road, Kilmarnock, Ayrshire.
- Osborne, Frederick William Seguin, St. Anthony, Vivian Avenue, Hendon, London, N.W.4.
- Owen, Edward John, 17, Park Street, Upper Bangor, N. Wales.
- Owens, Ridland, 62, Eaton Avenue, Litherland, Liverpool.
- Palmer, Herbert John, 41, Newcastle Street, Cubitt Town, Poplar, London, E.14.
- Parker, William Henry, 42, Mill Lane, Kidderminster.
- Parkinson, Reginald Henry, 14, Canton Street, Poplar, London, E.14.
- Pearson, Edward Feakes, Stapenhill, 32, Iona Road, Glasnevin, Dublin.
- Pike, Richard Edwin, 12, Artillery Buildings, Greycoat Place, Westminster, London, S.W.1.

- Purdie, Desmond Tremeer, 34, Hillmarton Road, Holloway, London, N.7.
 Quick, William Clifford, 13, Brighton Road, Weston-super-Mare.
 Redsell, Edward Norman, 81, Clumber Street, Hull.
 Scott, Miss Winifred Isabel, Model Schools, Ballymena, Ireland.
 Shacklock, Cecil Wilson, 49, Stanhope Gardens, London, N.4.
 Smetham, Denis John, 60, Lordship Park, Stoke Newington, London, N.16.
 Surfleet, Robert, The Limes, Beckingham, Doncaster.
 Thomas, Edward Boaden, 31, Ordnance Road, St. John's Wood, London, N.W.8.
 Thomas, Iorwerth, 7, Carlton Road, Sunny Bank, Clydach-on-Tawe Glam.
 Thompson, Stephen Percy, 7, Eckington Terrace, Glapton Road, Nottingham.
 Vigar, Laurence Edward Philip, 35, Botha Road, Plaistow, London, E.13.
 Walker, John, Clifton House, Slaithwaite, nr. Huddersfield.
 Ward, Henry Herbert, 4, Lyncot Road, Aintree, Liverpool.
 Watson, Harry Freeman, 5, Wrightson Street, Norton-on-Tees, Co. Durham.
 Watson, William John, 539, Holloway Road, London, N.19.
 Williams, Leslie Henry, 19, Cranwich Road, Stamford Hill, London, N.16.
 Wishart, Carl Courtenay, 3, Mayfield Terrace, Edinburgh.
 Woodley, James William Allan, 22, Taunton Road, Lee, London, S.E.12.
 Wright, Eustace Cecil Barton, Oakleigh, Godstone, Surrey.
 Wright, Miss Winifred Mary, 3, Addison Road, Kensington, London, W.

DEATHS.

Fellows.

- William James Chrystal.
 John Hughes.
 James Edward Johnson.
 Edmund James Mills, D.Sc. (Lond.), Hon. LL.D. (Glas.), F.R.S.

Associates.

- Francis William Buckland Cunningham, B.Sc.
 William Henry Templeman, B.A., LL.M.

Student.

- George Joynton.

Change of Name.

- Miss Ella Caird (Associate)—on her marriage, Mrs. Corfield.

CORRIGENDUM.—In the Journal, Part II., the degree of Mr. P. K. O'Toole, given as M.Sc. (Dub.), should have been stated M.Sc. (N.U.I.).

General Notices.

Notice to Associates.—Associates elected prior to June, 1918, who can produce evidence satisfactory to the Council that they have been continuously engaged in the study and practical applications of chemistry for at least three years since their election to the Associateship, can obtain from the Registrar particulars of the Regulations and forms of application for election to the Fellowship.

Appointments Register.—A Register of Fellows and Associates of the Institute of Chemistry who are available for appointments is kept at the Offices of the Institute. For full information, inquiries should be addressed to the Registrar.

Fellows and Associates are invited to notify the Institute of suitable vacancies for qualified chemists.

Registered Students in the last term of their college course may receive the Appointments Register of the Institute on the same terms as Fellows and Associates, provided that their applications for this privilege be endorsed by their Professor.

The Institute also maintains a Register of Laboratory Assistants who have passed approved Preliminary Examinations and, in some cases, Intermediate Science Examinations. A number of Registered Students of the Institute desirous of gaining practical experience will be glad to have opportunities of working in private laboratories or works during vacations.

Fellows and Associates who are able to offer vacancies to such assistants and students are invited to communicate with the Registrar.

The Library.—The Library is open for the use of Fellows, Associates and Registered Students, between the hours of 10 A.M. and 6 P.M. on week-days (Saturdays: 10 A.M. and 2 P.M.) except when examinations are in progress.

The Library of the Chemical Society is also available for the use of Fellows and Associates of the Institute wishing to

consult or borrow books, from 10 A.M. to 9 P.M. on week-days (Saturdays from 10 A.M. to 5 P.M.).

Registered Students using the Library are informed that Mr. Marlow, the Assistant Secretary, is available to those who desire advice with regard to books on subjects in which they are specially interested.

Changes of Address.—In view of the expense involved through frequent alterations of addressograph plates, etc., Fellows, Associates, and Registered Students who wish to notify changes of address are requested to give, as far as possible, their *permanent* addresses for registration.

Publications of the Institute.—A few copies of the following publications of the Institute are obtainable by Members and Registered Students at the special prices indicated :—

PROCEEDINGS (prior to 1920). Four Parts annually. 1s. each net.

JOURNAL AND PROCEEDINGS (1920). Six Parts. Each Part 2s. net.

HISTORY OF THE INSTITUTE, 1877-1914. 10s.—Special Edition 21s

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“Cement.” Bertram Blount, F.I.C. 2s. 6d. net.

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“Chemistry in Gas Works.” W. J. A. Butterfield, M.A., F.I.C. 2s. 6d. net.

“The Research Chemist in the Works with Special Reference to the Textile Industry.” W. P. Dreaper, F.I.C. 2s. net.

“Explosives.” William Macnab, F.I.C. 2s. 6d. net.

EXAMINATION PAPERS. Annual Sets (prior to 1917), 6d. each (7d. by post). After 1917, 1s. post free.

To all other purchasers, the Lectures will be charged at 5s. each ; the ordinary edition of the History at 21s., and the Special Edition at £2 2s.

The Register of the Institute is in course of revision for publication in the autumn. Fellows, Associates, and Registered Students are requested to notify the Registrar *immediately* of any alterations with regard to degrees, addresses, etc., which they wish to be made in the new edition.

Building Fund.—The name of Mr. C. M. W. Grieb was inadvertently omitted from the List of Contributors of £1 1s., published in the Journal, Part I. (p. 87).

2 3 2

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FOUNDED, 1877.
INCORPORATED BY ROYAL CHARTER, 1885.

JOURNAL AND PROCEEDINGS.
1921.

PART IV.

Issued under the supervision of the Publications Committee.

RICHARD B. PILCHER,
Registrar and Secretary

30, RUSSELL SQUARE, LONDON, W.C. 1.
August, 1921.

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Proceedings of the Council.

(June—July, 1921)

Instruction in Chemistry in Technical Schools and Colleges in England and Wales.—In May last the Council were approached by the Board of Education, who were desirous of encouraging day and evening students in technical schools to follow properly graded and balanced grouped courses of instruction in chemistry and allied subjects. The Board had in view the establishment of a scheme for the award of certificates which would be recognised in all parts of the country and not merely in the district in which any particular school might be situated. The Council thereupon appointed as representatives of the Institute:—The President (Mr. A. Chaston Chapman, F.R.S.), with Mr. Horatio Ballantyne, Sir Herbert Jackson, K.B.E., F.R.S., Prof. Gilbert T. Morgan, O.B.E., F.R.S., and Dr. T. Slater Price, O.B.E., to confer with the representatives nominated by the Board:—Mr. W. R. Davies, C.B. (Principal Assistant Secretary), with Mr. A. Abbott (Chief Inspector of Technical Schools), and Mr. C. H. Creasey, Dr. A. Jamieson Walker, F.I.C., and Mr. J. Wilson, F.I.C. (H.M. Inspectors).

Conferences were held on 30th June and 20th July.

At the first Conference, Mr. Abbott, in the unavoidable absence of Mr. Davies, was invited to introduce the matter for discussion. After referring to the organisation of science teaching and examination under the Science and Art Department during the latter half of the nineteenth century, and to the provision then made for instructing teachers in methods of teaching, Mr. Abbot said that, later, the Science and Art Department had become merged in the Board of Education. Teachers had become

more plentiful and more competent, and the old system of examinations had accordingly been abandoned. The responsibility of examining had been placed on the teachers themselves, the Board being prepared under certain conditions to endorse the certificates granted by the various Technical Institutions. The conditions laid down under this arrangement provided that the examinations for these awards should be internal, and that external assessors should co-operate with the teachers in the final examination. The endorsement scheme, however, was not widely adopted, and the value of the certificates was depreciated owing to their being of local rather than of national character.

The Board now desired, with the assistance of representative professional bodies, to initiate a new scheme designed especially for students who were unable to prepare for Degree Examinations of a University, but whose aim was to prepare themselves, according to their ability, for scientific work in connection with industry, although at the time they might not be able to comply with all the regulations with regard to training for the membership of the professional bodies.

Under the former Science and Art Department Scheme candidates could present themselves for examination in any one or more of some twenty-five subjects, and they were frequently somewhat ill-advised in their choice. In recent years, however, grouped courses of instruction had been followed by a large proportion of the students. The Board now sought to maintain and raise the standard of instruction provided in such courses, and, so far as chemistry was concerned, hoped to obtain the co-operation of the Institute.

Under the suggested arrangements it was proposed that students who devoted themselves to chemistry should take grouped courses, including chemistry, physics, and mathematics, and suitable approved cognate subjects. Mr. Abbott said that schemes of training would be evolved by the schools subject to the approval of the Institute and the Board, and such schemes would provide courses both for part-time (mostly evening) and for full-time students. It was proposed that the

system of internal examinations should be continued, so far as chemistry was concerned, but that the Institute, in conjunction with the Board, should appoint the assessors for the final examination of each course.

For part-time students the following certificates would be granted:—*Senior* at the end of a course of at least three years, and *Advanced* at the end of at least two further years.

For full-time students a certificate in chemistry would be granted on completion of a course of at least three years' training. A certificate in applied chemistry would be obtainable after the completion of an approved course of at least a further year.

In the case both of the part-time and of the full-time courses there would be, in the final year of the course, an examination conducted by the teachers under the supervision of assessors appointed by the Institute, who would be consulted both in regard to the examination questions and in regard to the marking. During the earlier years of the course the examinations would be under the sole control of the teachers, but the results of these examinations and other records of the students' work would be available to the assessors in the final year.

In the Senior part-time course the range of study in chemistry would be at least comparable with that undertaken in preparation for the Intermediate Science Examinations of the Universities, and in the Advanced part-time course at least comparable with that normally undertaken for a Final Pass B.Sc. For the full-time course certificate the range of study in Chemistry to be aimed at would be above that prescribed for the Final Pass, and would approach that prescribed for candidates for the B.Sc. with honours in Chemistry. The subjects covered in the courses would be recorded on the certificates. Special emphasis would be laid upon practical work.

The Conference discussed the general educational qualifications of students pursuing the proposed courses.

It was stated that all students wishing to take the full-time course certificates would be required to have passed a preliminary examination approved by the Institute and the Board, but, for the present, it was not considered desirable to insist upon students passing a preliminary examination prior to taking a part-time Senior or Advanced course.

In order to obviate any confusion with the Diplomas of Associateship and Fellowship of the Institute it was decided that the certificates should bear a statement of the conditions under which they are granted.

The Institute would consider at a later date whether and how far the training and the higher certificates should be recognised under the Regulations of the Institute.

The President assured the representatives of the Board that the Institute would be very willing to co-operate with the Board, and the Conference eventually agreed that the Board should be asked to prepare and submit a draft statement of the scheme which was duly considered at the meeting held on 20th July.

The Council have accepted in principle this suggested scheme, and expect, at a meeting to be held in October, to ratify the complete arrangements and put the scheme into immediate operation. They feel that the Institute is afforded a welcome opportunity to develop still further the objects of the Charter, by collaborating with the Board in promoting the study of chemistry. The Council, in considering applications for membership, have been repeatedly impressed by the large number of candidates who have devoted years to training themselves for their vocation, but have nevertheless fallen far short of the fundamental requirements of the Charter of the Institute. Such candidates, through lack of advice and assistance in the co-ordination of their courses of training, have frequently acquired considerable knowledge of one particular branch of chemistry without undergoing a thorough grounding in general (inorganic, organic, and physical chemistry and the cognate sciences. On account of their early

specialisation they have not only sacrificed the opportunity of joining the ranks of the profession in the Institute, but they have in many cases rendered their livelihood more precarious and dependent entirely upon the demands of the particular branch of industry in which they have specialised. The Council feel, therefore, that the collaboration with the Board of Education supplements the provision made for training Laboratory Assistants, and fits in with the revised Regulations for the Studentship. Every worker in chemical industry should now be afforded means, to an extent suitable to the nature of his calling, of obtaining sound instruction in the principles of the sciences he is putting into practice, while the keener workers will have every inducement to put themselves into line with the Institute's requirements should they desire eventually to qualify for the profession of chemistry.

Post-Graduate Training in Industrial Chemistry.—The Council have received from Mr. A. Cottrell copies of a letter which he addressed to the Editor of the Journal of the Society of Chemical Industry with regard to the question of post-graduate training in industrial chemistry. Mr. Cottrell suggests that the Government should be approached to ascertain whether it would not be possible to release for training purposes chemical plant and appliances now lying idle in various factories and to put it at the disposal of professors and teachers of technical chemistry. Mr. Cottrell has approached various authorities who are likely to be interested in the matter, and is seeking the co-operation of all professors of chemistry and of the Institute. The Council have expressed their readiness to support the proposal.

Institutions.—The Cardiff Technical College—in respect of its four-year Joint Diploma Course (in conjunction with University College of South Wales and Monmouthshire) and its five-year evening course—has been added to the list of institutions recognised for the training of candidates for the Examinations of the Institute, subject to certain conditions agreed between the Council of the Institute and the Authorities of the College.

The Profession in South Africa.—The Council have had an opportunity of reviewing, with Prof. J. A. Wilkinson, matters of interest to the profession in South Africa. Prof. Wilkinson, who is at present on leave in this country, is Head of the Chemical Department at University College, Johannesburg, and is a member of Council and a Past President of the South African Association of Analytical Chemists—a body which carries out in South Africa functions analogous in many respects to those performed in this country by the Institute. The South African Association is anxious to co-operate with the Institute, and the Council have concurred in a proposal that the name of that body should be more nearly allied to that of the Institute. The Council were glad to hear from Prof. Wilkinson of the many useful activities of the Association which are leading to the fuller recognition of the profession in South Africa. Information has since been received that the name “South African Chemical Institute” has been adopted.

Many Fellows and Associates of the Institute find employment in the various Dominions, and it is advantageous, in the general interest to maintain the closest touch and the most cordial relations, with the Dominion bodies analogous to the Institute. The Council, moreover, hope that as these bodies develop, their standards of qualification will be maintained on a level with those of the Institute, and may be reciprocally recognised in all parts of the British Commonwealth.

Benevolent Fund.—The Benevolent Fund Committee have reported that they have recently dealt with two applications for assistance from the fund. They feel that the existence of the fund is of real benefit to members who have fallen on hard times. The financial position is, however, not so secure as to justify them in being as generous as they would wish, and they earnestly hope, therefore, that all Fellows and Associates will make some donation to the fund.

The Committee suggest that if every Fellow and Associate subscribed 5s. annually to the fund, it would have an income

of about £900 per annum, and with such a sum the Committee would be well able to carry out the objects for which the fund was created.

The Council have instructed the Committee to consider and devise means for raising, in addition to an annual income from subscriptions to the fund, a substantial capital sum, the interest on which could be applied in the furtherance of the objects of the fund.

Appointments Register.—As a result of a recent enquiry it appears that there are approximately eighty members of the Institute seeking engagements. In all the circumstances, the proportion, in respect to the total membership of the Institute, is remarkably small, but every possible step is being taken to introduce these members to suitable positions. A circular, directing attention to the Appointments Register, has been addressed to a large number of firms who usually employ chemists, and also to many firms who may not at present employ chemists, but might in their own interest utilise their services. In selecting the lists of firms to whom this circular should be addressed, the Council have sought the co-operation of the Local Sections, and they ask Fellows and Associates to suggest the names of firms who should be approached on the matter, so that the circular may be as widely and effectively distributed as possible.

Laboratory Assistants.—Fellows and Associates are also asked to communicate with the Registrar in any instance in which they are able to assist in finding employment for laboratory assistants, so that these junior posts may be filled by youths who have shown their keenness to undertake the necessary courses of training which will lead to a professional qualification.

The Institute's Register of Laboratory Assistants comprises the names of youths who have addressed themselves personally to the Institute and also of those who have been put into touch with the Institute by the Secretary of the

Secondary School Headmasters' Employment Committee acting in co-operation with the Ministry of Labour, Appointments Department.

The Register contains only the names of youths who have passed an approved preliminary examination, and whose parents certify that the youths are of necessity precluded from undergoing a systematic four years' day course at a recognised college, and give an undertaking (*a*) that they shall attend an approved evening course of study with a view to obtaining the Associateship of the Institute, and (*b*) that they shall apply to be registered as Students of the Institute.

Provision is made that when an assistant has once secured a post through the agency of the Register, he will not be allowed the further use of the Register except on the production of satisfactory certificates of the work he has done in the intervening period. By this means those who are unlikely to qualify will be dissuaded from pursuing a career in chemistry before they have reached such an age that it is difficult for them to adopt another vocation.

The Register is divided into three grades:—

- GRADE A. Assistants who have passed an approved preliminary examination.
- „ B. Assistants who have also satisfactorily completed studies of the standard of a first year University course.
- „ C. Assistants who have also satisfactorily completed studies of the standard of a second year University course.

Local Sections.

Belfast and District.—The First General Meeting of the Section was held at the Municipal Technical Institute, Belfast, on June 16th. The meeting adopted the Draft Rules for Local Sections provisionally, and appointed a Committee and Secretary as follows:—Mr. J. H. Totton, B.A., B.Sc., Chairman; Miss N. I. Maxwell, M.Sc., Treasurer; Messrs. W. G. Bennett, M.Sc., H. Graham, M.Sc., A. P. Hoskins, C. J. Still, B.Sc., and Dr. W. H. Gibson, O.B.E., Hon. Secretary.

Bristol and South Western Counties District.—The Section has not yet held its inaugural meeting owing to the difficulties caused by the recent coal strike. The inaugural meeting will probably be held in September. There are already nearly 50 members of the Section. Members interested are requested to address enquiries to Prof. J. Wertheimer, D.Sc., F.I.C., Merchant Venturers' Technical College, Bristol.

Liverpool and North-Western Counties.—The Committee of the Section are arranging an interesting programme for the forthcoming session. The first meeting will be held on October 13th, and will take the form of a smoking concert, the main purpose of which is to provide an opportunity for the registered students resident in the district to meet one another and the Fellows and Associates who are Members of the Section. The Committee are also arranging to hold a joint dinner with the Liverpool Section of the Society of Chemical Industry.

The Committee have assisted the Institute in preparing a list of firms in the district who should be approached with a view to the employment of chemists. The Committee report that the financial position of the Section is satisfactory and that there is every reason to expect renewed and increased energy in the forthcoming session.

London and South-Eastern Counties.—The Committee of the Section are preparing the agenda for the forthcoming session. The first meeting will take place on the 18th October, and it is hoped early in the session to hold a dinner on behalf of the Institute's Benevolent Fund, by which means the Committee expect to raise a considerable sum for the Fund.

Newcastle and North-East Coast Section.—On the occasion of his retirement from the Chair of Chemistry in the University of Durham, Prof. P. P. Bedson, was presented with a mahogany bookcase.

The presentation, in which members of Local Sections of the Institute of Chemistry, the Society of Chemical Industry, and members of the Chemical Industry Club (Newcastle) were associated, was made by Dr. J. T. Dunn, Prof. Louis being in the chair. Dr. Dunn congratulated Prof. Bedson on the fact that during his thirty-nine years as Professor of Chemistry, he had been instrumental in training some of our most prominent chemists, and had won the respect of all who had passed through his hands.

Notes.

Brewing Research.—The Council have received the first report of the Research Fund Committee of the Institute of Brewing which deals with the initial work of the Research Scheme. The Institute of Brewing is controlling research on the various biological and agricultural aspects of the industry, and the chemical work is being carried out at the College of Technology, Manchester, with the object of isolating the constituent or constituents of the hop on which antiseptic or preservative qualities depend. Chemical work is also being carried out at the Imperial College of Science and Technology with a view to studying the various kinds of timber which are suitable for cask making.

Personal.

A deputation representing the leading engineering societies of the United States has lately visited this country to present the John Fritz medal to Sir Robert A. Hadfield. The medal is the highest honour in the gift of the engineering profession in the United States. Among the names of previous recipients are those of Edison, Goethals, Graham Bell, Kelvin, Westinghouse, and Orville Wright.

The Council of the University College of Wales, Aberystwyth, have appointed Dr. T. Campbell James to the chair of chemistry and the Directorship of the Edward Davies Chemical Laboratories in succession to Professor B. Mouat Jones, who was recently appointed Principal of the Manchester College of Technology.

Many friends of Mr. Otto Hefner will be glad to hear that he is benefiting greatly by his journey to South Africa. On his arrival in Cape Town he was met by Dr. Juritz, Honorary Corresponding Secretary of the Institute, who had arranged a number of visits for him to places of interest in the neighbourhood, and had also arranged for him to meet a number of eminent scientific and public men, including the Prime Minister, who was in Cape Town at the time. He has now proceeded to the Transvaal.

At a meeting held at the Columbia University on April 18th, the Chandler Medal was presented to Prof. F. Gowland Hopkins in public recognition of his pioneer work in the study of food accessories, such as vitamins.

Dr. Percy Claude Cameron Isherwood has been appointed to the Humphrey Owen Jones Lectureship in Physical Chemistry, in the University of Cambridge.

Dr. D. W. Jones has been appointed to the chair of chemistry at the University College of Wales, Cardiff, in succession to Prof. C. M. Thompson, who has retired.

Mr. Arthur James Hale has been appointed Professor of Chemistry in the Finsbury Technical College.

July Examinations, 1921

Summary of Report of the Board of Examiners.

Examinations were held at the places and on the dates given below :—

In General Chemistry, for the Associateship, at the Institute, July 4th to 8th.

Branch (b) For the Associateship, at the University of Sheffield, July 11th to 15th.

Branch (d) For the Associateship, at the Institute, July 4th to 8th.

Branch (e) For the Associateship, at the Institute, July 4th to 8th.

Branch (g) For the Associateship :—

In the Chemical Technology of Soap Manufacture and the Chemical Technology of Coal Tar Distillation and Intermediate Products, at the Institute, July 4th to 8th.

In the Chemical Technology of Coke Oven Practice, at the College of Technology, Manchester, July 4th to 8th.

For the Fellowship :—

In the Chemical Technology of Explosives, at the Royal Technical College, Glasgow, and at Messrs. Nobel's Explosives Co., Ardeer, Stevenston, Ayrshire, July 4th to 8th.

Twenty-five candidates presented themselves ; the number examined in each branch and the number of those who passed are shown in the following table :—

	NUMBER EXAMINED.	NUMBER PASSED.
For the Associateship.		
General Chemistry	14	8
Branch (b) Metallurgical Chemistry ..	1	1
Branch (d) Organic Chemistry	2	2
Branch (e) Chemistry of Food and Drugs, etc.	4	3
Branch (g) Chemical Technology. Chemical Technology of Explosives ..	1	0
For the Fellowship.		
Chemical Technology of Coke Oven Practice	1	1
Chemical Technology of Soap Manufacture	1	1
Chemical Technology of Coal Tar Distillation and Intermediate Products ..	1	0
	<hr/> 25	<hr/> 16

In the case of one candidate examined in General Chemistry the Board recommend that when he again presents himself he be not required to pass any part of the Examination except in the translation of technical literature from German into English.

The theoretical part of the Examination in General Chemistry was well answered by the successful candidates, except that the majority of the candidates showed an unsatisfactory knowledge of the history of chemistry.

In the practical part of the Examination the inorganic qualitative analysis was, on the whole, less satisfactory than was expected. Many of the candidates found difficulty in dealing with the phosphates in the mixture given. In the inorganic quantitative exercises most of the candidates displayed ingenuity in attacking the problem, but a high degree of accuracy was not generally attained. The qualitative analysis was on the whole well done but the quantitative exercises were not well carried out.

The translation of technical literature, especially the German translation, was only moderately well done.

The work of the successful candidates in the other branches was satisfactorily carried out.

The Pass List and particulars of the exercises, etc., are attached.

The thanks of the Council have been accorded to the authorities of the College of Technology, Manchester, of the Royal Technical College, Glasgow, of Messrs. Nobel's Explosives Co., Ardeer, and of the University of Sheffield, for laboratory accommodation.

The Board of Examiners is indebted to Mr. E. R. Bolton, Dr. F. H. Butler, Prof. Thomas Gray, Mr. I. V. Hopper, Mr. E. L. Rhead, Mr. William Rintoul, and Prof. F. J. Wilson, for help in connection with the Examinations.

PASS LIST

The following candidates have been successful in the recent Examinations and have been duly elected Associates of the Institute:

Examination in General Chemistry.

Campbell, Alan Newton, B.Sc. (Lond.).
 Doolan, James Joseph.
 Evans, Benjamin Beardmore, B.Sc. (Birm.).
 Hand, Percy George Terry.
 Jenkin, John Watson.
 Pugh, William.
 Ridge, Bert Pusey.
 Woolf, Sidney Samuel, B.Sc. (Lond.).

Examination in Metallurgical Chemistry.

Storer, George Paterson.

Examination in Organic Chemistry.

Kenyon, Frank.
 Sheldon, Francis Joseph, A.R.C.S., B.Sc. (Lond.).

Examination in the Chemistry of Foods and Drugs, etc.

Martin, Charles William.
 Mooney, Paul Michael, B.Sc. (Lond.).
 Woodward, Miss Elsie.

Examination in Chemical Technology.
(Soap Manufacture.)

Smith, David Dow.

(Coke Oven and By-Product Practice.)

Whitaker, John Wilfrid, B.Sc. (Lond.).

Examinations : July, 1921

EXAMINATIONS FOR THE ASSOCIATESHIP.

General Chemistry.

MONDAY, JULY 4th, 1921 : 10 a.m. to 1 p.m.

(Only six questions to be answered.)

1. Briefly indicate the advances in chemical science associated with the names of (1) Lavoisier, (2) Davy, (3) Bunsen.
2. Give an account of Thallium and its chief compounds and contrast this element with lead and potassium.
3. Describe the reactions between sodium nitrite and sulphurous acid and show how hydroxylamine may be prepared from one of the products.
4. What is meant by the "electrolytic solution pressure" of a metal? Show how this conception may be applied to explain the production of a current in a Daniell cell.
5. Explain the term "metastable state," giving three illustrative examples in your answer.
6. Give a brief account of the fixation of atmospheric nitrogen.
7. Write a short essay on the "Co-ordination Theory" as applied to metal-ammines.
8. Discuss the relation of manganese to its neighbours in the periodic arrangement.

(Only six questions to be answered.)

1. Give an account of the Walden Inversion.
2. In what ways is ethyl acetoacetate used in synthetic organic chemistry? Give a brief account of the type of tautomerism of which this compound is an example.

3. The structure $\text{CH}:\text{CH}_2$ is suggested for an organic



compound. What means would you employ to establish this constitution?

4. Write a short essay on the Beckmann rearrangement.
 5. Give an account of the nitration of aromatic substances referring to—
- (1) The reagents employed: (2) the position taken up by the nitro-groups (3) the influence of these groups on the behaviour of others attached to the nucleus.

6. Write an essay on *either* (1) the constitution of camphor, or (2) the general methods used in determining the constitution of alkaloïds.

7. State how the following reagents are prepared and describe the purposes for which they are used: Benzoyl chloride, phenyl isocyanate, phenyl hydrazine, semicarbazide and diazomethane.

8. Describe the synthesis of (1) phenacetine, and (2) any local anæsthetic agent.

TUESDAY, JULY 5th, 1921 : 10 a.m. to 4.30 p.m.

You are given a solution containing approximately 10 per cent. of a mixture of potassium and sodium chloride and iodide (two salts only). Estimate the amounts of each constituent.

(This exercise may be completed to-morrow.)

WEDNESDAY, JULY 6th, 1921 : 10 a.m. to 4.30 p.m.

1. Complete yesterday's exercise.

2. Make a qualitative analysis of the mixture supplied, containing 4 metal and 3 acid radicles. [AlCl_3 ; MgCl_2 ; $\text{Ba}(\text{NO}_2)_2$; Na_2HPO_4 .]

THURSDAY, JULY 7th, 1921 : 10 a.m. to 4.30 p.m.

You are given a mixture of two esters of organic acids. Identify these and estimate the amount of each present. [Ethyl Oxalate and Ethyl Benzoate.]

(The identification must be completed to-day, but the estimation may be continued to-morrow.)

FRIDAY, JULY 8th, 1921: 10 a.m. to 4.30 p.m.

1. Complete yesterday's exercise.

2. You are supplied with a sample of aniline prepared from pure nitrobenzene. Examine this for impurities and estimate the amount of aniline present. [Impurity: nitrobenzene.]

Branch (b)—Metallurgical Chemistry.

MONDAY, JULY 11th, 1921 : 10 a.m. to 1 p.m.

(Five questions only to be answered.)

1. What refractory materials are used in the lining of a coke oven, the construction of the roof of an open-hearth steel furnace, and the lining of a Bessemer converter? Mention the special qualities of each material.

2. How is copper extracted electrolytically from an ore in which it is present as a readily soluble salt? What material is suitable for the anodes in such a process?

3. How are pig irons classified? Describe the influence of each of the usual impurities found in pig irons on the properties of the iron.

4. Mention some of the rarer metals which have become important in metallurgy, and describe their principal applications.

5. Describe some form of optical pyrometer employed in the measurement of high temperature. Explain clearly the principle on which it works, and indicate the chief sources of error.

6. How would you examine a sample of coal in order to determine its value for metallurgical purposes? Describe carefully the tests you would employ.

7. What micro-structures would you expect to find in—

- (a) a steel containing 0.4% C, heated to 900 C. and slowly cooled;
- (b) the same steel, quenched from 1000° in cold water;
- (c) a heavy casting of Admiralty gun metal;
- (d) a bearing metal containing 15% tin, 12% antimony 2% copper, and 71% lead;
- (e) a light aluminium alloy containing 4% of copper and small quantities of iron and silicon.

TUESDAY and WEDNESDAY, JULY 12th and 13th :

10 a.m. to 4.30 p.m.

Make as complete an analysis as possible of the given nickel-chrome steel.

Examine the specimen of brass, and determine the principal impurity.

THURSDAY, JULY 14th : 10 a.m. to 4.30 p.m.

Make a microscopical examination of the given specimen of alloy. Sketch the structure, and report on its probable composition.

FRIDAY, JULY 15th : 10 a.m. to 4.30 p.m.

Make a dry assay of the given ore, and determine the percentage of silver in it.

Branch (d)—Organic Chemistry.

MONDAY, JULY 4th, 1921 : 10 a.m. to 1 p.m.

1. Give an historical account of the cinnamic acids, and describe the manner in which their constitutions have been determined.

2. Contrast the methods of preparation and the reactions of the mono-amino, mono-carboxylic acid and mono-hydroxy derivatives of pyridine and of benzene.

3. Discuss the large scale processes involved in the manufacture of (a) Saccharin, or (b) Phenacetin.

4. Maltose bears the same relationship to starch as cello-biose does to cellulose. Explain this statement and discuss the constitutional formulæ assigned to the two disaccharoses named.

5. Discuss the chemistry and describe the method of manufacture of any one technically important member of the Indanthrene series of colouring matters.

TUESDAY, JULY 5th, 1921 : 10 a.m. to 4.30 p.m.

1. A is a solution of a solid organic substance in an organic solvent. Identify each constituent and isolate a pure sample of each. [m. dinitrobenzene in bromo- or chlorobenzene.]
2. Report on the nature of the compound B. [Salicylamide.]

WEDNESDAY, JULY 6th, 1921 : 10 a.m. to 4.30 p.m.

1. C is a mixture of the two condensation products obtained by heating a mixture of anhydrous oxalic acid 1 mol. with aniline 2 mols. at 120° for an hour. You are required to determine the amount of each constituent of the mixture.
2. Examine and prepare a derivative of the compound D. [diphenylamine.]

THURSDAY, JULY 7th, 1921 : 10 a.m. to 4.30 p.m.

1. E is an organic cyanide. You are required to prepare from it, (a) the acid amide, (b) the acid, and to determine the melting point of each. [Benzyl Cyanide.]
2. Investigate the compound F. [Mercury Acetamide.]

FRIDAY, JULY 8th, 1921 : 10 a.m. to 4.30 p.m.

1. G is a mixture obtained in a faulty preparation of the iodo derivative of an aromatic hydrocarbon. You are required to (a) analyse the mixture qualitatively, (b) to isolate a pure sample of each ingredient of the mixture, and (c) to estimate the amount of one constituent of the mixture. [A mixture of Iodobenzene, Aniline and Phenol.]

Branch (c)—The Chemistry of Foods and Drugs, etc.

MONDAY, JULY 4th, 1921 : 10 a.m. to 1 p.m.

1. Write an account of the composition and chemical constitution of the natural oils and fats (not essential or mineral oils).
2. Detail the procedure laid down officially for the determination of the various forms of phosphate in a sample of fertiliser taken under the Fertilisers and Feeding Stuffs Act. Why are these forms of phosphate separately determined?
3. What is (a) a catalase, (b) a peroxydase? Discuss the importance of these bodies in milk analysis.

Answer the following questions in a separate notebook :

Therapeutics, Pharmacology and Microscopy.

1. Describe the characteristics of Oxalic Acid as a poison. How would you decide in a given case that death was due to the administration of the acid?

2. Describe the various forms of "Extracts" comprised in the British Pharmacopoeia, giving examples of each.

3. State the composition and medicinal dose of each of the following: *Liquor Arsenii et Hydrargyri Iodidi*; *Pilula Hydrargyri*; *Liquor Atropinae Sulphatis*; *Tinctura Aconiti*; *Tinctura Quininae Ammonia*; *Tinctura Nucis Vomicae*; *Tinctura Chloroformi et Morphinae*; *Pulvis Ipecacuanhae Co.*

4. Describe fully the technique involved in the microscopical examination of stains upon clothing which are suspected of being blood stains.

2 to 5 p.m.

1. Determine as accurately as time will allow the arsenic in the sample of Beer A.

2. Using a human blood corpuscle as a standard, estimate approximately the average diameters of the Starch granules contained in the powder B. [Oatmeal.]

3. Examine the deposit from the sample of water C. Draw and identify any significant structures that may be present. [Deposit taken near a sewage outflow.]

TUESDAY, JULY 5th, 1921 : 10 a.m. to 4.30 p.m.

1. Examine the specimen of acid calcium phosphate and report as to its suitability for use in the preparation of a baking powder. [Excessive CaSO_4 .]

2. From a microscopical examination of the given specimen of ground ginger report as to its purity. [Adulterated with Capsicum.]

WEDNESDAY, JULY 6th, 1921 : 10 a.m. to 4.30 p.m.

1. Determine in duplicate the percentage of morphine in the given Tincture of Opium.

(This exercise may be completed on Thursday.)

2. Examine microscopically the sediment from the decoction of tea provided; identify any foreign matter present. [Sawdust.]

3. Identify the substance A. [Caffeine Citrate.]

THURSDAY, JULY 7th, 1921 : 10 a.m. to 4.30 p.m.

1. Complete the analysis of the Tincture of Opium.

2. Determine the original gravity of the sample of beer provided.

3. Submit the given liquid to the Reinsch test: mount microscopically, and shew to the examiner, the arsenious oxide crystals obtained.

FRIDAY, JULY 8th, 1921 : 10 a.m. to 4.30 p.m.

1. Determine the percentage of crude fibre in the sample of meal provided.

2. Determine the amount of oxygen in solution in the given sample of water.

General Chemical Technology.

MONDAY, JULY 4th, 1921 : 10 a.m. to 1 p.m.

1. Discuss the action of the commoner inorganic acids on the commercial varieties of iron and mention any industrial applications of iron for the construction of plant to deal with these acids. State the composition and physical characteristics of any special acid-resisting iron alloys.

2. State the composition of Portland Cement and explain its behaviour when mixed with a limited proportion of water, referring to the influence of (a) Calcium sulphate and (b) free lime. Specify, without giving details, the tests used for valuing cement and explain the purpose of each.

3. How is the refractory character of a clay firebrick influenced by the proportion of alumina to silica present and what is the effect of other normal constituents of clay? Indicate generally the composition of "acid," "basic," and "neutral" firebricks and give an account of their physical characteristics.

4. Give a brief statement of the various methods which have been proposed for preventing corrosion and scale formation in steam boilers and describe any one of them.

5. Give a short statement of the current views regarding the constitution of coal and of the methods suggested for the classification of coals.

6. Sketch any form of oil burner and discuss shortly the various methods of burning liquid fuels. Compare and contrast oil with coal, referring to the following points:—(a) Supply, (b) labour in handling, (c) storage, and (d) efficiency in use.

2 to 5 p.m.

1. Sketch any form of gas producer and describe the method of operating it. Specify the qualities you would look for in a good producer coal and discuss the prevention of clinkering trouble.

2. Describe the methods used industrially (a) for mixing powdered solids and (b) for the separation of two solids: Sketch one form of plant in each case.

3. Sketch (a) a continuous-acting, rotary filter and (b) a vacuum filter plant, with arrangements for elevating the clear filtered liquid to an overhead tank, showing the filter and receiver in section. Suggest a method of separating a finely divided solid from sulphuric acid of 80% strength and specify the necessary materials of construction.

4. Sketch an over-driven hydro-extractor with bottom discharge, showing the method of controlling the gyration of the cage. How is the centrifugal force related to the speed of rotation, the diameter of the cage and the weight of the charge?

5. Show diagrammatically the arrangement of a plant for evaporating in vacuo a thin liquid from which crystals separate. Give sectional sketches, illustrating the construction of the evaporator and condenser.

6. Explain with the help of a diagram the principle of evaporation by multiple effect and discuss the advantages of this system.

Branch (g)—The Chemical Technology of Soap Manufacture.

The Candidate was required to take the above two papers in General Chemical Technology.

TUESDAY, JULY 5th, 1921 : 10 a.m. to 1 p.m.

(The Candidate is expected to attempt all the questions.)

1. Describe the method of manufacture of Soap by the Cold and Boiling Processes, dealing with the relative costs, advantages and suitability of raw materials to the respective processes.

2. Write a Specification suitable for a contract for Household Soap, and enumerate the tests you would apply to the soap to see if the contract had been fulfilled, stating the information obtainable from each test.

3. Give the origin, properties and uses of the following :—

- (a) Acid Oil,
- (b) Soap Stock,
- (c) Melted Stuff,
- (d) Black Grease.

4. Write a brief description of methods of Fat Splitting, dealing with the use of Autoclaves, Twitchell's reagent and Enzymic methods.

2 to 5 p.m.

(The Candidate is expected to answer the first three questions and one other.)

1. What materials would you select and what quantities would you use to make 100 tons of Carbolie Soap, which would contain 50% total Fatty Matter including Rosin ?

2. Briefly describe the manufacture of pure Glycerol from spent lye.

3. Discuss the use of hydrogenated fat for soap making.

4. Briefly describe any three fats which differ widely from one another, commonly used in soap manufacture, and also discuss them from the standpoint of Glycerine yield.

5. Define Soft Soap and mention purposes for which it is used.

6. What is meant by "detergent action" and what theories have been put forward to explain it ?

WEDNESDAY and THURSDAY, JULY 6th and 7th, 1921.

1. Make a general analysis of the sample of soap A, including Rosin estimation, but not including an investigation into the composition of the Fatty Matter.

2. Estimate the moisture, impurities and caponifiable matter in the sample of Palm Kernel Acid Oil C.

3. Make the necessary analysis to recognize respectively the two fats marked B and D, and say if you consider them to be good merchantable quality. [Cocoanut Oil and Shea-nut Oil.]

Branch (g).—The Chemical Technology of Coal Tar Distillation and Intermediate Products.

TUESDAY, JULY 5th, 1921 : 10 a.m. to 1 p.m.

The candidate was required to take the above two papers in General Chemical Technology. (see p. 254).

(Only four questions to be answered, of which No. 1 must be one.)

1. A coke oven works produces 100 tons of tar per day. Describe two plants. (a) Intermittent ; (b) Continuous ; to distil this into the preliminary fractions of naphtha, creosote, anthracene oil, and pitch. Give special attention to the kinds of metal to be used and the sizes of the stills.

2. Compare the two methods referred to in question 1.

3. What are Carbazol and Cumarone ; in what fractions do they occur in the distillation of coal tar, and how are they isolated ?

4. Describe briefly any commercial method for the separation of 60's crude carbolic acid and crude cresylic acid.

5. What is a dephlegmator ? What functions does it perform ?

6. A works produces anthracene (testing 32%) by filtering and centrifuging. It is desired to improve the product to a minimum of 40%. How would you proceed to do this ?

2 to 5 p.m.

(Only four questions to be answered, of which No. 1 must be one.)

1. Describe the various processes for the manufacture of synthetic phenol (for Picric Acid) from pure benzene. State the yields you would expect to obtain and the chief sources of loss.

2. What is technical Toluidine, and how is it prepared commercially ?

3. Describe the preparation of α and β Naphthol and the methods adopted to vary the proportionate yields of the two substances.

4. Describe a laboratory method for the separation of the three isomers of Cresol from 97.99% pale cresylic acid.

5. What is Benzyl chloride ? How is it prepared, and for what is it used ?

6. What is an autoclave ? Give a sketch : describe its general uses and give the details of any one process in which it is used.

WEDNESDAY, JULY 6th, 1921, and THURSDAY, JULY 7th, 1921 : 10 a.m. to 4.30 p.m. each day.

1. A is a sample of crude naphtha. Determine its value by means of its commercial (not pure) products ; (assume values for the products).

2. B is a sample of crude anthracene. Determine the amount of paraffins.

3. Prepare one of the sulphanilic acids from nitro-benzene.

4. State whether you consider sample B is anthracene of A or B quality.

Examination for the Associateship in Branch (g).

Chemical Technology of Coke Oven & By-Product Practice.

The candidate was required to answer two papers in General Chemical Technology (see p. 254).

TUESDAY, JULY 5th, 1921 : 10 a.m. to 1 p.m.

(Only five questions to be answered.)

1. Give a classified list of coals and other fossil fuels showing the relationship of the caking to the non-caking varieties, and write an account of the methods of determining the caking power.

2. State what you know of the modern ideas of the constitution and components of coal and the relation of the caking power to the components.

3. Give some account of the varying effect of the rate of increase and final temperature on the character of the products of the coking operation. State how far it is possible for these conditions to be modified in modern coke ovens.

4. Describe as fully as possible the preparation of coal for coking purposes up to the point of introduction to the ovens. State clearly the reasons for each operation, and include in your answer references to modern improvements and proposals for the treatment of coal for making coke.

5. Discuss the tendencies in the development of by-product ovens, stating the advantages and possible disadvantages of the modification. Make such sketches as are necessary in illustration of your answer.

6. State clearly and fully the considerations that would guide you in the selection and setting of brickwork and other refractories in building by-product ovens. What tests would you apply to the materials and what points require special attention in supervising the erection?

7. Describe types of pyrometer suitable for use on a coking plant. State the principles on which they are based.

8. What are the main characters required in good blast furnace coke? State the conditions under which they can be best obtained, and how you would test the coke mechanically to ascertain its fitness.

TUESDAY, JULY 5th, 1921 : 2 to 5 p.m.

(Only five questions to be answered.)

1. Give some account of the occurrence of sulphur in coal and its disposition in the products of coking. Describe proposals for its more complete elimination from coke.

2. State the general composition and amount of tar from (a) a fat coal, (b) lignite. State how its composition varies with the temperature and period of the operation.

3. Discuss the methods of recovering the ammonia from coke oven gas and of treating the ammoniacal liquor. In describing apparatus, special care should be taken to emphasise the principles on which it relies for its efficiency. Make such sketches as may be necessary.

4. Give a description of the method you would adopt for the preparation of motor benzol from coke oven distillation products. What tests would you employ to ascertain its quality?

5. If coke oven gases be applied to town lighting, what special treatment must they receive and what special modifications of plant will be necessary?

6. How would you proceed to determine the calorific value of a sample of gas? Sketch and fully describe the apparatus you would use.

7. Give an account of the various appliances that may be employed for lifting and transferring the liquids produced and used on a coking plant.

8. What arrangements would you make for the treatment of 50 tons of tar per week? State the nature and approximate amount of the product. Give a sketch showing the disposition of the plant.

WEDNESDAY, July 6th, 1921 : 10 a.m. to 5 p.m.

1. You are required to identify the materials supplied, to describe their properties and, where essential, the causes that have led to their production. (Anthracene; Xylol; Bromobenzene; Graphitised Coke; from a crack in a "black end").

2. Examine the coal supplied. Determine its calorific power, and make such chemical examination as is necessary to determine the purposes to which it could be satisfactorily applied.

If unfinished, you may complete this exercise on the following day.

THURSDAY, July 7th, 1921 : 10 a.m. to 5 p.m.

1. Analyse the sample of gas supplied.

2. Determine the strength of the sample of ammoniacal liquor.

Examination for the Fellowship in Branch (g).

The Chemical Technology of Explosives Manufacture.

The candidate was required to answer two papers in General Chemical Technology (see p. 254).

TUESDAY, July 5th, 1921 : 10 a.m. to 1 p.m.

1. Write a short description of the various methods for the manufacture of picric acid, and describe the characteristic properties of this explosive.

2. What are the chief sources of cellulose used in the manufacture of Cordite? How is the raw cellulose purified and what tests are applied to the purified material?

3. Describe the particular precautions to be observed in storing and handling the following:—

Blasting Gelatine. Trinitrotoluol.

Nitric Acid. Dinitrochlorbenzol.

Acetone. Cotton waste ready for nitration.

Empty sodium nitrate bags.

4. Describe the principal stability tests applied to nitrocellulose. Which of these tests is best suited for:—

(1) The control of manufacture.

(2) The examination of a sample of unknown origin.

TUESDAY, July 5th, 1921 : 2 to 5 p.m.

1. Write a short essay on recent advances in explosives technology.
2. Classify the following explosives with regard to their properties and applications, and describe the manufacture of any one of those marked with an asterisk :—

*Hexanitrodiphenylamine.
 Lyddite.
 Lead azide.
 *Tetryl.
 Bobbinitite.
 *Ballistite.
 Rex Powder.
 Ammonal.
 Hexanitrodiphenyl sulphide.
 Neonal.
 Dinitrotoluol.

3. Describe fully all the tests with which an explosive must comply before it can be used as a permitted blasting explosive in coal mines.
4. Draw up a scheme for the complete analysis of Cordite M.D.

THURSDAY and FRIDAY, July 7th and 8th, 1921 : 10 a.m. to 4.30 p.m. each day.

1. Make a full analysis of Blasting Explosive Sample A.

(Composition :

					%
Ammonium Perchlorate	..	..	..	..	50
Sodium Nitrate	..	..	..	..	35
Dinitrotoluol 1·2·4	..	..	..	..	9
Paraffin Wax..	..	..	..	..	6
					—
					100)
					—

2. Make a full analysis of the sample of mixed acid B and carry out with it a preparation of hexanitro-mannitol, determining the yield and melting point of the product.

(Checked analysis of Acid :

					%
Sulphuric Acid	..	..	..	..	59·87
Nitric Acid	..	..	..	..	38·92
Nitrous Acid	..	..	..	..	0·24
Water ..	..	..	..	..	0·97
					—
					100·00)
					—

3. Identify the moderant in the sample of propellant explosive C. (A nitrocellulose powder containing amyl phthalate.)

Candidates were required to translate from German and French technical literature into English. The passages given in the foregoing examinations were selected from the following :

GERMAN.

- Ber. 1919: Sept. p. 1709, "Versuche Skala verfolgt."
 Ber. 1919: Nov. p. 2072, "231 J. Houben Hindernis."
 Ber. 1919: Oct. p. 1883, "Versuche Molekulargewicht."
 Ber. 1919: Dec. p. 2237, "C. Neuberg ausgebildet" (p. 2238).
 Ber. 1920: Jan. p. 14 2 pars. "Das beim Überleiten 3 Stunden benötigt."
 Ber. 1920: Feb. p. 180, par. 1, "Reaktion unter Benzol-Xylol . . . Genusch."
 Ber. 1920: Mar. p. 454, from "Zur Bestimmung der Ketogruppen" to end of page.
 Ber. 1920: Apr. p. 585, "(a) Trennungsmethoden" to end of page.
 Ber. 1920: May p. 824, "Experimenteller Teil umkristallisierte wurde" (p. 825).
 Ber. 1920: June p. 922, 2nd and 3rd par., "Wir erhitzen wirksam waren."
 Ber. 1920: July p. 1219, par. "2-methylderivat."
 Ber. 1920: Sept. p. 1454, top of page down to "Ausbeute ca. 73%."
 Ber. 1920: Oct. p. 1932, "Benzoyl-ameisensäure" to end of page
 Ber. 1920: Nov. p. 2138, "Der so erhaltene Olefin Verpuffung verspritzte."
 Ber. 1921: Jan. p. 154, "Oxim des 3-n-Propyl -2(5) acetothienons" to end of page.
 Ber. 1921: Feb. p. 247, "Versuche ihre Menge betrug ca. 5 g."
 Ber. 1921: June p. 902, "Walter Hieber der Brom Einwirkung."
 Ber. 1921: July p. 1182, "Hydro-cuprein Petroläther."

FRENCH.

Chimie et Industrie, 1920 :—

- Jan. p. 42 Sect. entitled "Diminution de la capacité"
 Feb. p. 157 Sects. „ "Premier mode" and "Second mode."
 Mar. p. 313 Sect. „ "Emploi de la conductibilité"
 April p. 422 Intro. section "L'isolement filaments de tungstène."
 May p. 617 Sect. entitled "Détermination qualitative et quantitative du molybdène dans le fer et l'acier."

FRENCH—*continued.*

June	p. 755	Sect. entitled	"Catalyse."
June	p. 756	.. ..	"Réactions à haute température."
July	p. 44	.. ..	"Divisions naturelles."
Aug.	p. 200	.. ..	"Modification à la méthode de Pearce pour le dosage de l'arsenic."
Sept.	p. 318	.. ..	"Résines solubles pyrogénées."
Oct.	p. 457	1st par. and 2nd (part of) (top of next column)	"L'analyse electrolytique" . . "extrêmement important."
Nov.	p. 597	1st 6 pars.	"Lorsqu'un rayon phosphores- cents."
1921.			
Dec.	p. 722	1st 2 pars.	"Les conditions à bas prix."
April	p. 371	1st 4 pars.	"Nul n'ignore ce cas particulier."
Feb.	p. 136	"Les gaz de l'échappement des gaz d'échappe- ment."	
1921.			
Jan.	p. 36	"L'emploi de cupferron le manganèse."	
Feb.	p. 206	"Matériel de controle de ce dernier."	
Mar.	p. 288	"Simplifications apportées cinq minutes."	
1920.			
June	p. 778	"Procédé de dissociation essences légères."	

Books and their Contents.

[*Books presented by the authors or publishers to be seen in the Library of the Institute.]

"Animal Proteins." H. G. Bennett. Pp. xiii. and 287.
(London: Bailliere, Tindall & Cox.) 15s.

Hides for heavy leathers; skin for light leathers; chrome leathers; miscellaneous tannages; gelatine and glue; miscellaneous proteins; by-products.

"Engineering Steels." L. Aitchison. Pp. xxxi. and 397.
(London: MacDonald & Evans.) 25s.

Steel melting processes; casting and working; heat treatment; mechanical testing; plain carbon steels; case hardening steels; cold worked steels; tool steels.

* "French-English Dictionary for Chemists." A. M. Patterson.
Pp. xvii. and 384. (New York: John Wiley & Sons, Inc.; London: Chapman & Hall, Ltd.)

"History of Chemistry." Sir Edward Thorpe. Pp. 300.
(London: Watts & Co.) 7s.

Volume I.: From earliest times to the middle of the 19th Century.

"Liquid and Gaseous Fuels and the part they play in modern Power Production." Vivian B. Lewes. 2nd edition, revised and edited by J. B. C. Kershaw. Pp. xiv. and 353. (London: Constable & Co.) 12s. 6d.

Combustion; fuel; determination of calorific value; liquid fuels; manufacture of coal gas; use of coal gas for heating and power; water gas; poor fuel gas; appendix of tables.

"Manufacture of Pulp and Paper." J. J. Clark and T. L. Crossley. Pp. x. and 182. (New York and London: McGraw Hill Book Co.) 30s.

Vol. II.: Mechanics and hydraulics; elements of electricity; elements of chemistry.

Metallography." S. L. Hoyt. Pp. xiv. and 462. (New York and London: McGraw Hill Book Co.) 28s.

Vol. II.; Metals and common alloys; white metal alloys; light metal alloys; brasses and bronzes; steel.

"Monographs of Industrial Chemistry: The Electric Furnace."

J. N. Pring. Pp. ix. and 485. (London: Longmans, Green and Co.) 32s.

Types of furnace for experimental laboratory work; measurements of high temperatures; manufacture of calcium carbide and of nitrogen compounds; electric smelting of iron ores; electric steel furnaces; production of ferro-alloys; application for the preparation of alloys of non-ferrous metals; electro metallurgy of zinc and of copper; production of carborundum, silicon, alundum graphite, phosphorus and carbon bisulphide; electrolytic processes with fused electrolytes; refractories; heat losses; appendices of tables and bibliography.

"Organic Chemistry, Fundamental Principles of." C. Morcau.

Translated from the 6th French edition by W. T. Braunscholtz. Pp. 400. (London: J. & A. Churchill & Co.) 12s. 6d.

"Physical Chemistry for Colleges." E. B. Millard. Pp. vi. and 411. (New York and London: McGraw Hill Book Co.) 21s.

Laws of gases; liquids; solids; solutions; thermo-chemistry; chemical equilibrium; velocity of reactions; physical properties and chemical structure; periodic law and radio chemistry; atomic structure; colloids; electro-chemistry.

* "Sulphur and Sulphur Derivatives." Harold A. Auden.

Pp. 101. (London: Sir Isacc Pitman & Sons, Ltd.) 3s.

Sulphur; Sulphur Dioxide and Sulphurous Acid; Sulphides; Sulphates; Sulphuric Acid Manufacture; Oleum; Concentration and De-arsenication of Sulphuric Acid; Residual Products.

"Textile Soaps and Oils." G. H. Hirst. 3rd edition, revised by W. H. Simmons. Pp. 208. (London: Scott, Greenwood & Son.) 10s. 6d.

"Wood Products, Distillates and Extracts." P. Dumesny and

J. Noyer, translated from the French 2nd edition, revised by H. B. Stock. Pp. 365. (London: Scott, Greenwood & Son.) 21s.

Obituary.

BERT JOHN APPLEBY died at Birmingham on the 5th June in his 29th year. Trained at the Birmingham Municipal Technical School, he was for three years a demonstrator in the Chemical Department of the Birmingham Municipal Technical School, and for eight years works chemist and later chief chemist to the Crane Chemical Co., Ltd. He was elected to the Associateship in 1919.

DAVID BROWN died at Edinburgh on June 21st in his 82nd year. The son of David R. Brown, of Messrs. J. F. Macfarlane & Co., manufacturing chemists, of Edinburgh, he was educated at the Royal High School, and studied chemistry at the University. He was for some time engaged as assistant demonstrator to Prof. George Wilson, and later in a similar capacity to Prof. Thomas Anderson at Glasgow University, before he joined the staff of Apothecaries' Hall, in London. He then assisted Dr. A. Matthiessen in research at St. Bartholomew's Hospital before he returned to Edinburgh to join his father in the manufacture of pharmaceutical products, ultimately becoming senior partner in the firm. He was author of various papers contributed to pharmaceutical literature. He was elected a Fellow of the Institute in 1887.

The Institute has only recently been notified of the death in July, 1920, of FRANCIS WILLIAM BUCKLAND CUNNINGTON, in his thirtieth year. Trained at University College, London, he graduated with Honours in Chemistry at the University of London, and was for a short time Assistant Chemist to the British Metal Extraction Company, Swansea. He was commissioned in the Royal Army Service Corps in November, 1914, and served throughout the war. He died from injuries received in a motor bicycle accident. He was elected an Associate of the Institute in 1919.

CHARLES ESTCOURT died on June 24th in his 85th year. A native Gloucester, he was educated at Manchester, and, having devoted himself to the study of chemistry from an early age, was for a time engaged at the Inland Revenue Laboratory at Somerset House, London.

In 1872 he was appointed Public Analyst to the Corporation of Manchester, which position he held for 47 years. He was also Public Analyst for Ashton-under-Lyne, Bacup, Lancaster, Macclesfield, and

Oldham. He was author of various papers on river and atmospheric pollution. He was elected a Fellow of the Institute in 1878. His son, PHILIP ANDERSON ESTCOURT, who was also a Fellow, and was for some time associated with his father in practice, died in 1919. Both he and his son devoted much time to public affairs at Stretford, and were members of many local social, artistic and scientific associations.

JOHN HUGHES died in London on 5th June at the age of 77. He was trained at the Royal Agricultural College, Cirencester, and under Dr. Augustus Voelcker, with whom he remained for nine years; thereafter he was with Messrs. Lawes & Co., for five years. At about the time of the foundation of the Institute he visited Ceylon and its coffee plantations on behalf of the Planters' Association. On his return to England he engaged in analytical and consulting practice in the City of London, and was appointed Official Agricultural Analyst to the County of Hereford. He was elected a Fellow in 1878, and was a Member of Council for two periods, from 1891 to 1894, and 1897 to 1900.

HENRY RONDEL LE SUEUR died at St. Thomas' Hospital on the 9th July in his 50th year, having developed while on active service in Gallipoli a condition of health which destroyed his power of resistance to an attack of pneumonia. A native of Jersey, he worked for two years in the laboratory of Mr. F. W. Toms, at St. Helier's. He continued his training at University College, London, graduated in 1893, and obtained the Doctorate of Science in the University of London in 1901. During the whole of his professional life he was associated with St. Thomas' Hospital Medical School, first as demonstrator of chemistry and physics, and thereafter as lecturer on chemistry. During the war he served as a Major in the Royal Engineers in Gallipoli, and later at the Experimental Station at Porton, to which he was one of the first officers appointed. He subsequently proceeded to America to assist in the preparation of the American Gas Warfare Experimental Station. He was one of the Secretaries of the Chemical Society, and most of his work was published in the *Journal of the Society*. He passed the Examination for the Associateship of the Institute in 1893, and was elected a Fellow in 1898. He served as a member of the Council from 1914-1917.

FREDERIC RICHARD MALLET died on the 24th June at Ealing in his 81st year. Trained at Trinity College, Dublin, under Dr. Apjohn, and at the Royal School of Mines, under Dr. Frankland, he joined the Geological Survey as Assistant in 1859. He was engaged in various expeditions and held the appointment of Keeper of the Mineral Collections, and later Superintendent of the Geological Survey of India. He was author of many scientific papers relating chiefly to mineral chemistry which were published in the records of the Geological Survey of India. He was elected a Fellow of the Institute in 1888.

JOHN STUART McCRAITH died at Stockport on July 9th in his 35th year. Born at Chorlton-on-Medlock, he was trained at the Manchester College of Technology at which he was for a year research scholar. He was an Associate of the College, and a Master of Science in Technology of the University of Manchester. He was successively assistant chemist at the Brymbo Steel Works, at the Hawarden Bridge Iron Works, and to the Tungsten and Rare Metals Co., London, and for eight years chief assistant chemist to the Daimler Motor Co. Since 1916 he had been chief chemist to Hans Renold, Ltd., Manchester, where he has actively associated with the original work in connection with rust proofing of cast iron fuse bodies. He was elected an Associate of the Institute in 1918.

ERNEST WILLIAM SMITH died at Hull on June 10th in his 41st year. He was trained at University College, Nottingham, passed the Examination for the Associateship of the Institute in the Branch of Organic Chemistry in July, 1913, and was elected a Fellow in January, 1917. He graduated B.A. and B.Sc. of the University of London. He was for some time Assistant Lecturer in Chemistry at Hull Technical College, and from 1905 until the outbreak of war was head of the Pure and Applied Chemistry Department of the Technical College, Halifax. He enlisted in October, 1914, and served until September, 1916, in the Royal Army Medical Corps, when he was transferred for chemical work under the Ministry of Munitions at H.M. Factory, Gretna. He contracted tuberculosis during his service in France, from which he did not recover.

JOHN, WILLIAM REGINALD YOULL died at Chelmsford on July 6th shortly after his 24th birthday. He was trained at the Finsbury Technical College, at which he obtained the certificate, and was elected an Associate of the Institute last year. On the completion of his training he was engaged as an assistant chemist at the Government Laboratory.

Changes in the Register.

At the meetings of the Council held on June 24th and July 22nd, 1921, 1 Fellow was elected and 1 Associate was elected to the Fellowship; 82 Associates were elected; and 25 Students were admitted.

The Institute has lost 5 Fellows and 4 Associates by death.

New Fellow.

Naik, Professor Kuverji Gosai, M.A., B.Sc. (Bombay), Organic Chemistry Research Laboratory, Royal College of Science, South Kensington, London, S.W. 7.

Associate Elected to Fellowship.

Brownlee, George, B.Sc. (Edin.), Royal College of Science for Ireland, Dublin.

New Associates (by Examination).

Campbell, Alan Newton, B.Sc. (Lond.), 33, Micheldever Road, Lee, London, S.E. 12.

Doolan, James Joseph, 288, High Road, Ilford, Essex.

Evans, Benjamin Beardmore, B.Sc. (Birm.), 48, Oakwood Road, Sparkhill, Birmingham.

Hand, Percy George Terry, 199, Selhurst Road, South Norwood, London, S.E. 25.

Jenkin, John Watson, 21, Red Lion Road, Tolworth, Surbiton, Surrey.

Kenyon, Frank, 20, Wellfield Road, Blackburn.

Martin, Charles William, 66, Mitcham Road, East Ham, London, E. 6.

Mooney, Paul Michael, B.Sc. (Lond.), 1, Khedive Road, Forest Gate, Essex.

Pugh, William, Llanerch Farm, Pontardulais, S. Wales.

Ridge, Bert Pusey, Hampden Club, Hampden Street, London, N.W. 1.

Sheldon, Francis Joseph, B.Sc., A.R.C.S. (Lond.), 17, Conyers Road, Streatham, London, S.W. 16.

Smith, David Dow, 16, Empress Avenue, ^WWanstead Park, London, E. 12.

Storer, George Paterson, 48, Llanthewy Road, Newport, Mon.

Whitaker, John Wilfrid, B.Sc. (Lond.), Department of Mining, University College, Nottingham.

Woodward, Miss Elsie, 17, Bloomsbury Square, London, W.C. 1.

Woolf, Sidney Samuel, B.Sc. (Lond.), The Technical College, Loughborough.

New Associates.

Abbott, Walter Edgar, A.R.C.Sc.I., 65, Hollybrook Road, Clontarf, Dublin.

Adams, William Roy Cecil Coode, B.Sc. (Lond.), 1, Eton Avenue, Hampstead, London, N.W. 3.

Bailey, Robert Arthur, B.Sc. (Liv.), 4, Warton Street, Bootle, Liverpool.

Bains, Leslie, B.A. (Cantab.), B.Sc. (Lond.), 5, Carlton Road, Stroud Green, London, N. 4.

Barham, Ronald Jack, B.Sc. (Liv.), Derby Park, Oxford Road, Bootle, Liverpool.

Bausor, Harold William, M.A. (Cantab.), De Freville Lodge, De Freville Avenue, Cambridge.

Belaseo, Harry George, B.Sc. (Lond.), 48, Thornton Avenue, Streatham Hill, London, S.W. 2.

Blake, Thomas Arthur, B.Sc. (Lond.), 59, Cartwright Gardens, London, W.C. 1.

Bonniksen, Cyril Wilfred, B.Sc. (Lond.), Glenmore, 141, Tachbrook Road, Leamington Spa.

Bowen, Arthur Riley, B.Sc. (Birm.), 63, Bromyard Road, Worcester.

Breslin, John James, A.R.C.Sc.I., Royal College of Science, Dublin.

Brown, Leslie Gilbert, A.C.G.F.C., 6, Airlie Gardens, Ilford, Essex.

Callow, Ernest Harold, B.Sc. (Birm.), 55, Evelyn Road, Sparkhill, Birmingham.

Christie, George Hallatt, B.Sc. (Lond.), 155, Sharrow Vale Road, Sheffield.

Clatworthy, Miss Joan Catherine, A.C.G.F.C., 6, Beverley Road, Highams Park, Chingford, London, E. 4.

Coffey, Samuel, B.Sc. (Lond.), 67, Palin Street, Hyson Green, Nottingham.

Cooke, Frank, 12, Beechwood Terrace, Sunderland.

Curtin, Norman Richard Mary de Verdon, A.R.C.Sc.I., 29, Grove Park, Rathmines, Dublin.

Davis, Stephen Barton, B.Sc. (Liv.), 94, Hartington Road, Sefton Park, Liverpool.

Dawkins, David Richard, B.Sc. (Wales), Llwynceelyn, Wern Road, Skewen, near Neath.

Downing, Leonard Alfred, A.C.G.F.C., 17, Carholme Road, Forest Hill, London, S.E. 23.

Falkner, Ernest Basil, M.A. (Oxon), M.Sc., 52, Kensington Mansions, Earl's Court, London, S.W.

Farmer, Cecil Redvers Cheyney, B.Sc., A.R.C.S. (Lond.), 16, Therapia Road, Honor Oak, London, S.E. 22.

- Fenby, Alarie Vincent Colpoys, B.Sc. (Lond.), 45, Culmstock Road, Clapham Common, London, S.W. 11.
- Foster, Cecil Alfred Maunder, B.Sc. (Liv.), 23, Alfred Road, Birkenhead.
- Fox, Louis Jean Fielding, B.Sc. (Wales), 198, Lowergate, Longwood, Huddersfield.
- Freeman, Percy Tom, M.B.E., B.Sc. (Lond.), 16, Suffolk Avenue, Southampton.
- Godward, Leslie Wilfred Norman, B.Sc. (Lond.), 136, Kensington Avenue, East Ham, London, E. 12.
- Gordon, Isaac, B.Sc. (Leeds), 28, Elderslie Road, Eltham, London, S.E. 9.
- Green, Albert, M.C., B.Sc. (Wales), Tanyfron, 1, Cambridge Terrace, Aberystwyth.
- Green, Brian Michael, B.A. (Cantab.), 26, Upper Hamilton Terrace, London, N.W. 8.
- Griffiths, Philip Henry, B.Sc. (Wales), Arfryn, Alexandra Road, Gorseinon, Glam.
- Gupta, Iresh Chandra, M.Sc. (Calcutta), 21, Cromwell Road, South Kensington, London, S.W. 7.
- Hartley, Bernard Cecil, 28, Oakroyd Terrace, Manningham, Bradford, Yorks.
- Hartshorne, Norman Holt, B.Sc. (Birm.), 20, Arthur Road, Erdington, Birmingham.
- Hazeldon, John Nicholson, B.Sc. (Leeds), 74, Woodsley Road, Leeds.
- Holmes, Frederick Henry, B.Sc. (Lond.), 21, Albert Street, Melton Mowbray.
- Hudson, Donald Pryce, B.Sc. (Liv.), 9, Victoria Drive, West Kirby, Cheshire.
- Hughes, Miss Kathleen Harriet, 8, Ormiston Drive, Knock, Belfast.
- Ingall, Douglas Heber, B.Sc. (Birm.), Gower Cottage, 773, Chester Road, Erdington, Birmingham.
- Lawrie, Leslie Gordon, Stornoway, Golden Road, Kersal, Manchester.
- Lewis, Wilfred James, B.Sc., 22, Richmond Avenue, Sedgley Park, Manchester.
- Lorimer, John William, A.R.T.C., 55, Pembroke Road, Erith, Kent.
- Mann, John Colman, B.A. (Cantab.), 51, Chesterton Road, Cambridge.
- Marks, Sydney, B.Sc. Tech. (Mane.), 179, Heywood Street, Hightown, Manchester.
- Mendel, Eric Lazarus, A.C.G.F.C., 12, Campion Hill Gardens, Kensington, London, W. 8.
- McCaffery, Brian James, A.R.C.Sc.I., Royal College of Science for Ireland, Dublin.
- Miller, Miss Christina Cruickshank, B.Sc. (Edin.), 7, Douglas Street, Kirkcaldy, Fife.
- Norris, Frederick Walter, A.R.C.S., B.Sc. (Lond.), 11, Warner Road, Hornsey, London, N. 8.
- Oriel, John Augustus, B.A. (Cantab.), B.Sc. (Wales), Berry Square, Dowlais, S. Wales.
- Owen, Owen, B.Sc. (Wales), 66, Hill Street, Bangor, N. Wales.
- Owens, Ridland, B.Sc. (Liv.), 62, Eaton Avenue, Litherland, Liverpool.
- Price, Arthur, B.Sc. (Lond.), 86, Blenheim Road, Barnsley, Yorks.

- Quastel, Juda Hirsch, A.R.C.S. (Lond.), 73, Ecclesall Road, Sheffield.
 Rogers, Edgar William, B.Sc. (Lond.), 4L, Oxford and Cambridge
 Mansions, London, N.W. 1.
 Rushton, Thomas Bamber, B.Sc. Teeh. (Manc.), County Police Station,
 Haslingden, Lanes.
 Shaw, Miss Elsie, B.Sc. (Vict.), Thornhill, Dudley Road, Whalley
 Range, Manchester.
 Slate, James, B.Sc. (Vict.), 287, Park Road, Oldham, Lanes.
 Smith, James Frederick, 80, Cannon Hill Road, Birmingham.
 Stubbings, Wilfred Victor, B.Sc. (Lond.), Dalton Grange, Huddersfield,
 Yorks.
 Taylor, Lionel Theos, M.Sc. (Dun.), 1, Bideford Gardens, Whitley Bay,
 Northumberland.
 Wilson, Ernest Perry Bradley, B.Sc. (Birm.), 109, Hengist Road,
 Northumberland Heath, Erith, Kent.
 Winter, Ramsay Middleton, M.Sc. (N.Z.), Rothamsted Experimental
 Station, Harpenden, Herts.
 Woodroffe, David, B.Sc. (Leeds), 13, Primrose Hill, Northampton.
 Workman, Miss Olive, M.Sc. (Lond.), 15, Ribblesdale Road, Hornsey,
 London, N. 8.
 Wormall, Arthur, B.Sc. (Leeds), 20, Ashville View, Cardigan Road,
 Leeds.

New Students.

- Barnett, Roland, 199, Thorold Road, Ilford, Essex.
 Bartlett, Arthur, 9, Cambridge Street, Hull.
 Bassett, Henry Norman, 118, Dixon Street, Swindon, Wilts.
 Bate, Frank Harold, 25, Moor Lane, Witton, Birmingham.
 Burdekin, John Thomas, 59, William Street, Sheffield.
 Bushill, John Herbert, 61, Bowyer Road, Alum Rock, Birmingham.
 Earney, Frank Arthur, 141, Chesnut Road, Plumstead, London, S.E. 18.
 Fry, Victor Eric, 1, Westminster Gardens, Hillhead, Glasgow.
 Galinski, Myer, The Homestead, 135, The Common, Clapton, London,
 E. 5.
 Gheik, Nand Lal, c/o Messrs. Grindlay & Co., 54, Parliament Street,
 London, S.W. 1.
 Goodwin, George Harry, Kingsfield Oval, Basford, Stoke-on-Trent.
 Griffiths, Wilfred Stoughton, 43, Hengist Road, Erith, Kent.
 Grimwood, Robert Charles, 14a, Graham Road, Dalston, London, E. 8.
 Hart, Joel Edward, 249, Commercial Road, London, E. 1.
 Hoffenberg, Isidore Ely, 20, Carlton Mount, Woodhouse Lane, Leeds.
 Jones, John Mather, St. Loys Road, Tottenham, London, N. 17.
 Miller, Herbert Frederic, Cheviot, Village Way, Neasden, London,
 N.W. 10.
 Nicholson, Lawrence Reginald, 4, Dungarvan Avenue, Putney, London,
 S.W. 15.
 Roberts, Denis, 120, Hillingdon Street, Kennington, London, S.E. 17.
 Seager, John Horsford, 1, St. Mary's Road, Faversham, Kent.
 Steele, Andrew, 20, Drumoyne Avenue, Linthouse, Glasgow.

Tadman, Vernon Thorpe, 189, Woodborough Road, Nottingham.
 Tidy, Sydney George, 77, Malvern Road, Thornton Heath, Surrey.
 Walker, William Basil, 61, Mundella Road, Meadow, Nottingham.
 Winsor, William George, Burton House, Mill Hill, London, N.W. 7.

DEATHS.

Fellows.

Brown, David, J.P.
 Esteourt, Charles.
 Le Sueur, Henry Rondel, D.Se. (Lond.).
 Mallet, Frederic Richard.
 Smith, Ernest William, B.A., B.Se. (Lond.).

Associates.

Appleby, Bert John.
 Cunningham, Francis William Buckland.
 McCraith, John Stuart, M.Sc.Tech. (Mane.).
 Youll, John William Reginald.

General Notices.

Examinations.—An Examination in Bio-Chemistry will be held in October, 1921. The list of candidates will be closed on Monday, September 19th. Intending candidates can obtain full particulars from the Registrar.

Notice to Associates.—Associates elected prior to October, 1918, who can produce evidence satisfactory to the Council that they have been continuously engaged in the study and practical applications of chemistry for at least three years since their election to the Associateship, can obtain from the Registrar particulars of the Regulations and forms of application for election to the Fellowship.

Appointments Register.—A Register of Fellows and Associates of the Institute of Chemistry who are available for appointments is kept at the Offices of the Institute. For full information, inquiries should be addressed to the Registrar.

Fellows and Associates are invited to notify the Institute of suitable vacancies for qualified chemists.

Registered Students in the last term of their college course may receive the Appointments Register of the Institute on the same terms as Fellows and Associates, provided that their applications for this privilege be endorsed by their Professor.

The Institute also maintains a Register of Laboratory Assistants who have passed approved Preliminary Examinations and, in some cases, Intermediate Science Examinations. Fellows and Associates who are able to offer vacancies to such assistants are invited to communicate with the Registrar.

A number of Registered Students of the Institute desirous of gaining practical experience will be glad to have opportunities of working in private laboratories or works during vacations.

The Library.—The Library is open for the use of Fellows, Associates and Registered Students, between the hours of 10 A.M. and 6 P.M. on week-days (Saturdays: 10 A.M. and 2 P.M.) except when examinations are being held.

The Library of the Chemical Society is also available for the use of Fellows and Associates of the Institute wishing to consult or borrow books, from 10 A.M. to 5 P.M. on week-days (Saturdays from 10 A.M. to 5 P.M.) until September 10th, and thereafter on week-days until 9 P.M.

Registered Students using the Library are informed that the Assistant Secretary is available to those who desire advice with regard to books on subjects in which they are specially interested.

Changes of Address.—In view of the expense involved through frequent alterations of addressograph plates, etc., Fellows, Associates, and Registered Students who wish to notify changes of address are requested to give, as far as possible, their *permanent* addresses for registration.

Publications of the Institute.—A few copies of the following publications of the Institute are obtainable by Members and Registered Students at the special prices indicated:—

PROCEEDINGS (prior to 1920). Four Parts annually. 1s. each net

JOURNAL AND PROCEEDINGS (1920). Six Parts. Each Part 2s. net.

HISTORY OF THE INSTITUTE, 1877-1914. 10s. Special Edition 21s.

LECTURES:

“Cement.” Bertram Blount, F.I.C. 2s. 6d. net.

“Cellulose.” C. F. Cross, B.Sc., F.I.C. 2s. 6d. net.

“Thorium.” Edmund White, B.Sc., F.I.C. 2s. net.

“Chemistry in Gas Works.” W. J. A. Butterfield, M.A., F.I.C. 2s. 6d. net.

“The Research Chemist in the Works with Special Reference to the Textile Industry.” W. P. Dreaper, F.I.C. 2s. net.

“Some Scientific Aspects of Tanning.” J. T. Wood, F.I.C. 2s. 6d. net.

EXAMINATION PAPERS. Annual Sets (prior to 1917), 6d. each (7d. by post). After 1917, 1s. post free.

To all other purchasers, the Lectures will be charged at 5s. each; the ordinary edition of the History at 21s., and the Special Edition at £2 2s.

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THE
INSTITUTE OF CHEMISTRY
OF
GREAT BRITAIN AND IRELAND.

FOUNDED, 1877.
INCORPORATED BY ROYAL CHARTER, 1885.

JOURNAL AND PROCEEDINGS.
1921.

PART V.

Issued under the supervision of the Publications Committee.

RICHARD B. PILCHER,
Registrar and Secretary.

39, RUSSELL SQUARE, LONDON, W.C. 1.
October, 1921.

Publications Committee, 1921-22

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Proceedings of the Council.

(October, 1921)

Instruction and Examinations in Chemistry in Technical Schools.—The arrangements, referred to in Part IV., entered into between the Board of Education and the Institute, with regard to the award of National Certificates in Chemistry, have now been confirmed.

The Council have received a few letters on the subject from Fellows of the Institute generally expressing approval of the scheme. One, however, expressed distrust of it, until he was assured that candidates for the Senior Certificate would be required to pass an approved Preliminary Examination in subjects of general education, and another said that he feared that the Institute would be expected, in the course of time, to admit candidates who obtained the Senior Certificate to the Associateship on easy terms. The Council have no intention of lowering in any way the standard of the requirements for the Associateship, but they will consider whether and how far the training and the higher certificates referred to in the scheme will qualify for admission to the examination for the Associateship of the Institute. The scheme, which will be put into immediate operation, will no doubt be watched with interest by many members, and the Council will report on its progress in due course.

Registered Students.—The majority of the Committees of the Local Sections favour the admission of Registered Students to the ordinary meetings of the Sections, but it is hoped in the future that Students' Societies will be formed under the ægis of the Sections, or at least that informal

meetings will be arranged from time to time especially for Students, in order to enable them to meet one another as well as established members of the profession. The Committee of the London and South-Eastern Counties' Section propose to convene a conference of representatives of the Chemical Societies of the various Colleges in London to consider in what way the Institute can be of greater help to its Registered Students within the area.

The Register.—A new issue of the Register of Fellows, Associates and Students is being issued with this Part.

Lectures.—Fellows, Associates and Registered Students are invited to a Lecture on "Modern Applications of Chemistry to Crop Production" by Dr. Edward John Russell, O.B.E., F.R.S., Director of the Rothamsted Experimental Station, to be given in the Chemical Lecture Theatre, King's College, London, by kind permission of the Delegacy of the College, on Monday, November 14th, at 8 p.m.

Mr. Horatio Ballantyne's lecture on Chemists and the Patent Laws, with special reference to the Patents and Designs Act, 1919, and its application to chemical patents, will be delivered early in 1922.

British Engineering Standards Association.—In response to an invitation from the British Engineering Standards Association to appoint a representative to take part in a conference with a view to the preparation of a standard specification of Iron Portland Cement, Prof. Cecil H. Desch has been appointed to act as the representative of the Institute.

Standardisation of Glassware.—The President, with Sir Herbert Jackson (Vice-President), Mr. E. W. Voelcker (Hon. Treasurer), and Dr. J. J. Fox and the Registrar attended a conference convened by the Director of the National Physical Laboratory, held on October 20th, at the Department of Scientific and Industrial Research, with regard to the Standardisation of Glassware. The proceedings will be reported in the next issue of the Journal.

Leather Trades' Chemists.—Mr. Francis H. Carr, Member of Council, represented the Institute at the recent conference of Leather Trades' Chemists.

British Empire Exhibition (1923).—The President has accepted an invitation to join the General Committee of the British Empire Exhibition (1923) as representative of the Institute.

Canadian Institute of Chemistry.—At the annual meeting of the Canadian Institute held on August 29th, a resolution was passed conveying most hearty congratulations and best wishes to the Institute of Chemistry of Great Britain and Ireland with an assurance of the co-operation of the Canadian Institute in anything pertaining to the good of the profession. The Council have forwarded a reciprocal message to the Canadian Institute.

Notes.

Ministry of Munitions.—The Institute has received for its library, copies of Mr. Macnab's "Preliminary Studies for H.M. Factory, Gretna, and study for an installation of Phosgene manufacture."

Mr. Macnab's book illustrates the methods adopted by Mr. K. B. Quinan and the staff of the Department of Explosives Supply in the study of technical problems and in the calculations which formed the basis on which factories were constructed, as well as in the scientific control of the work.

The book, which contains a lucid description of the various departments of the Gretna factory, with numerous illustrations and diagrams providing much detailed information, may be studied with advantage by any industrial chemist, and should be of great value to students desirous of securing an idea of operations on the large scale.

Attention is directed to the following abstracts from introductory remarks: "the principle of systematically and carefully calculating the quantities of raw materials and finished products, at all stages of the processes, so that plant of proper size and a well-balanced works can be constructed, applies to all industries." "Experience has shown that the more earnest thought and study, based on all available scientific data, which are put into the plans for a works or process at its inception, before plant is ordered or building operations begun, the sooner and more certainly will satisfactory results be obtained."

"Many of the drawings and reports to be issued should prove of much assistance to universities and teaching institutions in carrying out technical instruction, by showing good methods of applying scientific data to industrial questions and, by presenting concrete examples, thus vitalise to many students the apparently less interesting field of thermochemistry and other branches of physical chemistry."

In order to meet chemical industrial competition Mr. Macnab urges closer co-operation between the more strictly

theoretical and the technical workers, as well as the development of a class of business and financial men "whose education has been sufficiently broad to enable them to realise the sure foundations on which scientific conclusions rest, and to trust their scientific and technical advisers."

"In this country there has been too little mutual trust and appreciation of each other, and it must be the serious endeavour of all concerned to develop such sure methods of working out new processes in all details, and clearly presenting the results, that the business man may have a well-defined picture of the advantages to be gained, and the cost to be incurred, in so far as the factory is concerned."

"Greater knowledge on the part of those directing chemical work and the substitution of the rule-of-thumb men (who are often in complete charge of complicated processes) by intelligent chemists who will make it possible for real progress to be made are among the more obvious reforms to be introduced."

"The difficulty would be largely solved if men with good chemical training were in charge of chemical works, for then they could see to the works' training of the young chemists who came under them and prevent them from making rash experiments, and, at the same time, utilise to the full extent any knowledge or initiative which they might possess."

"The young chemist who starts work in a chemical factory finds himself confronted with plant instead of apparatus, much of which involves mechanical devices of various kinds, pumps and blow casks for moving liquids, mechanism and compressed air for agitating liquids, various methods of applying heat, etc., etc. He should make it his business to get first-hand knowledge of the way each part of the plant acts and a thorough understanding of the principles on which it works and is constructed."

"To do this he should take his coat off when a breakdown or stoppage occurs and see for himself what has been the cause, and learn and help to put matters right. Only in this way can he develop that knowledge of the capacities of a

plant and sympathy with it, which will enable the best results to be obtained."

"A plant should be treated well and considerately, and its legitimate working capacity not over-taxed. Careful attention to its smooth running and maintenance in good condition will be richly repaid in steady and uniform output."

"There is nothing *infra dig* in a highly trained scientific man doing the manual work involved in any of the processes under his control. Thereby he acquires a greater sympathy with and understanding of the men who have to do the regular manual work, which enables more just judgments to be formed as to what constitutes a fair day's work, and develops a mutual respect between chemist and workman."

"One does not rejoice in dirty work *per se*, but, as a means to an end, viz., the intelligent understanding of plant and process, it should be cheerfully undertaken when occasion arises. Also the more carefully a plant is controlled the fewer interruptions and occasions for rough work will arise."

"The study for an installation of phosgene manufacture, which is given, well illustrates Mr. Quinan's method of tackling a technical problem in a thoroughly scientific manner, and should be particularly illuminating to students and others in showing how physico-chemical data are utilised for industrial ends."

"It has been abundantly shown that the chemical knowledge and ability in this country, when adequately directed, can hold its own with that of any other land, but the stimulus of the common aim of quantity of output, and excellence of production, generated by the war, must not be allowed to die out. Every endeavour should be made by professors and students, technical and business men interested in chemical manufactures, as well as by the Government, to get to understand better the aims and requirements of each other, and co-operate in remedying any weaknesses in our system, and in developing chemical industry on sound scientific lines."

"It is realised that the conditions under which the Department conducted the various factories under its control were

somewhat abnormal, but the advantage of letting the chemist and those in control of plant and processes have as full knowledge as possible of the results of working their own special department, as well as those on which they depended, was abundantly justified in the living interest which most of the men took in their work and the excellent results which they attained."

The late Lord Moulton, in a foreword to Mr. Macnab's book, stated that the Department of Explosives Supply was guided and controlled by men well equipped with scientific knowledge, much valuable information had been accumulated at national expense, and it had been decided to publish as much as possible of the knowledge so gained in order that the nation might profit by it.

Undoubtedly the publication is justified by the valuable example of high endeavour and accomplishment thereby placed on record for the benefit of the coming generation of chemical technologists, to whom the study of these books is to be especially recommended, together with that of the two volumes of Technical Records of the Department of Explosives Supply, also compiled by Mr. Macnab, on:

- (1) The Denitration of Spent Acids,
- (2) The Manufacture of Trinitrotoluene,

which can also be seen in the Library of the Institute.

Burnham Technical Committee.—The Report of the Standing Joint Committee, Representative of Local Education Authorities and Associations of Teachers, on *Scales of Salaries for Teachers in Technical Schools*, etc., has recently been published. The object of the Committee was to secure by agreement on a national basis the orderly and progressive solution of the salary problem in schools of the type referred to, which are maintained by Local Education Authorities, or in which the Local Authorities accept responsibility for the salary scales.

The Committee endeavoured to prepare scales of salaries for teachers holding full-time appointments, classified in five

grades, which are defined in the Report:—(1) Principals, Head Masters, or Head Mistresses; (2) Heads of Departments; (3) Graduate Assistants; (4) Non-Graduate Assistants; (5) Instructors.

With regard to the salaries of Principals, Head Masters, and Head Mistresses, Heads of Departments and Instructors, however, the Committee recommend in general (with some reservations regarding the Heads of Small Schools), that Local Education Authorities should formulate their own standards for these appointments, such scales to be comparable with those adopted for similar classes of teachers in Secondary Schools within their respective areas.

Graduate Assistants are divided into (*a*) those who possess a degree of a University in the United Kingdom of Great Britain and Ireland or equivalent academic or professional qualifications; and (*b*) those whose industrial or commercial qualifications and teaching or other experience entitle them in the opinion of the Local Education Authority to be placed in this grade. For such Graduate Assistants the Committee recommend the following scales shall apply:—

England and Wales (except London):—	London (as defined in Section 5 of the Report):—
Assistant Masters:	Assistant Masters:
£240-£15-£500;	£290-£15-£550;
Assistant Mistresses:	Assistant Mistresses:
£225-£15-£400.	£275-£15-£440.

As additions to the above scales, the Committee recommend, *inter alia*, for a good Honours degree or its Technological equivalent, as determined by the Local Education Authority, to the minimum £25; to the maximum £50, the normal scale increments to apply throughout.

Non-Graduate Assistants include those teachers, not being Instructors, who have not, in the opinion of the Local Education Authority, the qualifications necessary for their inclusion in the Grade of Graduate Assistants. For such Non-Graduate Assistants the scale is considerably lower:—

England and Wales (except London):—	London:—
Assistant Masters:	Assistant Masters:
£190-£12 10s.-£400;	£210-£12 10s.-£450;
Assistant Mistresses:	Assistant Mistresses:
£177 10s.-£12 10s.-£320.	£197-£12 10s.-£360.

As additions to these scales, the Committee recommend *inter alia*—(a) for Non-Graduate Teachers of three years' training, £12 10s., and (c) for posts of special responsibility, not more than £50 for men, and not more than £40 for women.

In the case of (a) the ordinary scale maximum is not to be thereby exceeded, but this restriction shall not apply to an addition made under (c).

The point of interest to members of the Institute who are Teachers in Technical Schools is raised in respect of the recognition to be accorded to the qualifications of Associate-ship and Fellowship of the Institute, and attention is therefore specially directed to Section 6 :—

“QUALIFICATIONS EQUIVALENT TO A DEGREE.—The qualifications which may be recognised for the purposes of this Report as the equivalent of a degree of a University in the United Kingdom of Great Britain and Ireland shall be determined in the individual case by the Local Education Authority provided that the Standing Joint Committee may at any time issue a list of the qualifications which should be so recognised and may from time to time add to, withdraw from, or otherwise vary such list.”

With regard to the above Section, the Council hope that Local Education Authorities will recognise the Associate-ship of the Institute on the same basis at least as an Honours Degree and the Fellowship on the same basis as a Doctorate Degree, and that Associates and Fellows will receive corresponding emoluments. In this connection it should be noted under the general conditions laid down in Section 13, “that nothing in the Scales shall be held to limit the discretion of the Authority to recognise exceptional qualifications or experience by additional payments in an

individual case." Further, allowance may also be made, at the discretion of the Local Education Authority, in respect of time spent in industry, or in professional or in research work, after the age of 21, provided that not more than five years, or in special cases seven years, shall be so counted. Other allowances in respect of service are made in the case of certain other teachers in State-aided institutions.

Local Education Authorities, in considering the placing of Teachers who are not Graduates, on the Graduate Scale, are recommended to accept a less exacting standard for those who are already in the service of the Authority, and where a Non-Graduate has been placed by the Education Authority on the Graduate Scale, the Committee recommend such recognition shall continue in the application of the new scales.

Local Education Authorities are also recommended to recognise the case of Non-Graduate Teachers of adequate educational qualifications whose service in such Schools has been of a meritorious character and who were appointed on or before 1st April, 1921, by placing such teachers on the Graduate Scale.

The Committee recommend that the new scales shall come into operation as from 1st April, 1921. Previous service in certain schools, service with the Forces of the Crown during the war, or a period of internment in an enemy country as a civilian prisoner, is allowed to rank for the purpose of computing the salary under these scales.

Cost of Publication.—The Conjoint Board of Scientific Societies has forwarded to the Council of the Institute a copy of a reasoned statement forming the basis of an appeal, on behalf of certain of the Societies represented on the Board, for assistance towards the expenses of publication.

The greatly increased cost of printing, paper, and postage renders it very difficult for these societies to publish results of research on the same scale as before the war, although the output is greater and the need for means of publication correspondingly increased.

The Conjoint Board is convinced that serious limitations

are thus imposed on one of the most valuable national services, and that these limitations are adversely affecting the progress of science.

The cost of publications of technical societies has been undertaken for the most part by the societies, out of the funds subscribed by their members, including the actual research workers, but few of the societies have been able to do more than meet their liabilities, and all have been compelled to restrict their printing to communications which are original and constitute definite and important additions to knowledge. Their publications constitute the record of progress made; they have been enlarged or improved, indexes have been provided, and libraries have been maintained, in the interest of the advance of science, for the public good. For example, it is claimed that the application of science to war problems and the rapid evolution of means for combating the use of science by our enemies would not have been possible but for the resources of fact and principle accumulated in our scientific publications. The continuance of the work is no less vital to the rehabilitation of the industries of the country.

The societies have increased the subscriptions of their members, and have effected economies; but such measures cannot be carried beyond a certain point without endangering their objects.

Of fifty-five Scientific and Technical Societies represented on the Board, thirty-seven are making a determined effort to carry forward their work entirely without aid from the State, but the remaining eighteen are faced with serious financial difficulties in attempting to carry out the duties for which they exist.

The Conjoint Board appeal for further Government assistance for these bodies in the belief that the expenditure will produce the maximum results for the benefit of the science and industries of the nation, and suggest that possibly some arrangement may be made whereby the necessary aid might be afforded by the Department of Scientific and Industrial Research, or the Medical Research Council.

Local Sections.

Bristol and South-Western Counties Section.—Notice having been given to the forty-eight members in the district who had signified their desire to join the Section, a meeting was held at Merchant Venturers' Technical College on Saturday, 1st October, 1921, at 2.30 p.m. Nineteen members and the Registrar of the Institute were present.

On the nomination of Dr. Russell (City Analyst for Bristol), seconded by Mr. Embrey (City Analyst for Gloucester), Prof. Wertheimer was asked to take the chair. He explained that the meeting had been called to inaugurate the Section, to appoint a Committee and Secretary, and to adopt rules. He was glad to see a satisfactory attendance, which he felt would have been greater but for the fact that some members appeared to fear that a Local Section of the Institute might in some way be against the interests of the Local Section of the Society of Chemical Industry. In order to clear up any doubts on this score he suggested that before proceeding to the business the Registrar of the Institute should be asked to make a statement with regard to the activities of the Local Sections of the Institute. He gave particulars of the distribution of the members within the district and expressed the opinion that a meeting should occasionally be held in other centres than Bristol, for example, at Exeter.

The Registrar conveyed the best wishes of the President and Council for the success of the Section. He directed the attention of the meeting to the objects of the Sections as set forth in the Draft Rules, remarking that they were mainly concerned with advancing the interests of the profession by promoting good fellowship among the members. It was not intended that the Local Sections of the Institute should in any way encroach upon the work of other bodies. Their work was entirely different from that of the Local Sections of the Society of Chemical Industry, for instance. He referred to the good work done by other Local Sections; how they had advised the Council with regard to matters of local professional interest, had co-operated with the office in connection with the Appointments Register, assisted the

Nominations, Examinations, and Institutions Committee in the consideration of applications for membership, and had sent up suggestions with regard to the development of the work of the Institute, many of which had proved to be of considerable value. He appealed to the Section to help the Institute, especially in the direction of notifying suitable vacancies for chemists and assistants, and said that it would also be asked to help the Benevolent Fund Committee, should occasion arise to afford assistance to any member within the district. Bristol and the South-Western Counties were entitled to a representative on the Council of the Institute, and it was hoped that one would soon be elected. There were about 100 members in the district, and he hoped that they would all join the Section and take an active part in the proceedings.

The meeting proceeded to appoint a Secretary, and Mr. W. A. Storey, of Wick, near Bristol, was elected. The Draft Rules were then considered *seriatim*, being adopted as printed in 1918 with slight modifications. It was decided to refer Rules 5 and 6 to the Section Committee when appointed, to suggest further modifications thereon, and to make a recommendation to the Section with regard to the payment of a subscription.

Before proceeding to ballot for the Committee, the meeting agreed, on the motion of Mr. Bothamley, that the Committee should consist of 7, including the Secretary. It was then agreed to elect four members at that meeting, and to postpone the election of two more members until the next meeting, the provisional committee elected at the first meeting being empowered to carry on the preliminary business of the Section. Ballot having been taken, the following were declared elected members of the provisional committee: Mr. A. Marsden, Mr. Edward Russell, Mr. Thomas Tickle, and Prof. Wertheimer, with Mr. W. A. Storey as Secretary.

A vote of thanks was accorded to the authorities of the College and to Prof. Wertheimer for the use of the room, and the Registrar was also thanked for his attendance.

Glasgow and West of Scotland Section.—The Annual Dinner was held at the North British Hotel on Thursday, October 20th, 1921. About twenty-five members and the Assistant Secretary were present. The dinner was followed by the Annual General Meeting, when the report of the Secretary and Treasurer was received and adopted. The following members were elected to fill three vacancies on the Committee: Prof. R. M. Caven, Mr. J. W. Tait, and Prof. F. J. Wilson. Mr. William Rintoul was unanimously elected Chairman, and Dr. A. J. Robertson, Hon. Secretary and Treasurer.

At the conclusion of the official business, the Chairman, Mr. J. Macleod, welcomed the Assistant Secretary, who, in reply, referred to the useful work of the Local Sections in assisting the Council and in promoting a sense of comradeship amongst the Fellows and Associates. He also referred briefly to the recent proceedings of the Institute, dealing more particularly with the arrangements under which laboratory assistants are encouraged to qualify for membership of the Institute. The meeting adjourned for an informal smoking concert, to which the members present contributed.

Liverpool and North-Western Section.—On October 13th, at the North-Western Hotel, the Section held a meeting followed by a smoking concert. Registered Students within the District were invited to attend, but only a few were present. The Committee hope to see more on a future occasion. The Assistant Secretary of the Institute was present.

Manchester and District Section.—The Annual General Meeting of the Section will be held on November 2nd.

Among other fixtures for the coming session, arrangements have been made for a Joint Meeting of the Manchester Sections of the Institute, the Society of Chemical Industry, the Society of Dyers and Colourists, and the Manchester Literary and Philosophical Society, to be held on January 7th, 1922, when Dr. Arthur Harden will deliver an address on "Bio-Chemical Method."

Newcastle and North-East Coast Section.—A luncheon, arranged by the Newcastle and North-East Coast Section, was held at the Station Hotel, York, on Saturday, 24th September. Over fifty members from all parts of Yorkshire attended. Dr. J. T. Dunn presided, and the Registrar of the Institute was also present. A circular had previously been issued to members in the district, indicating that it was impossible for the executive at Newcastle to keep in touch with other than strictly local members, consequently a large proportion of the Section was without the benefits and privileges attached to it. The luncheon had been arranged to afford an opportunity of discussing the formation of other Sections as offering the most efficient means whereby provincial members could influence the policy of the Council. After luncheon Dr. Dunn explained that the arrangements for the meeting had been very largely carried out by Dr. J. H. Paterson, of Newcastle, and Mr. G. N. Grinling, of York, to whom they were indebted for the success of the meeting. Having read a number of letters from members regretting their inability to be present, he briefly reviewed the history of the Newcastle and North-East Coast Section, indicating its utility to the members and to the Institute. In view, however, of the numbers, the large area covered by the Section, and the desirability of having further representation of the district on the Council of the Institute, it was thought that the members in the district would like to be brought together to discuss the position. He suggested, however, that the Registrar should first make a statement with regard to the objects of Local Sections, and he thought that he would probably give them other useful information which would assist in their deliberations.

The Registrar, in the first place, conveyed to the members present the best wishes of the President and Council for the success of the meeting; he also referred to letters of welcome which he had received and to others from members who were unable to be present, containing various suggestions. He was glad to see a strong representative gathering, and felt sure that something would be done. In the Yorkshire area there

were approximately 270 members, the main centres being Leeds and District with 68 members, Huddersfield 54, Sheffield 49, Bradford 46, Hull 19, York and Harrogate 15, and Middlesbrough 12. Sections were formed to create local organisations of members, to keep alive their interest in their profession, to maintain its status, to afford opportunities for social intercourse, to advise the Institute with regard to matters of local professional interest, to co-operate with the office in advising candidates for membership and in the work of the Appointments Register. The chief object, however, was to bring the members together to help one another, and to co-operate in strengthening the position of the Institute and the profession. During the war and since, not only the Institute, but Chartered Professional Bodies generally, had received greater recognition than at any time previously from the Government. Lately the Institute had been approached by the Board of Education to take an interest in the teaching of chemistry in Technical Schools in England and Wales. In future the Institute would be consulted with regard to the courses and examinations in chemistry in such Schools, and the Council had every reason to believe that this arrangement would be beneficial. The importance of the science of chemistry was better realised than ever it had been, but, for all that, the Institute was faced with problems in dealing with which the Local Sections might give substantial help. One was the question of unemployment. After the armistice, the Appointments Register of the Institute was so far instrumental in resettling chemists who had been engaged with the forces or on munitions work that at the end of 1920 there were only 13 members out of work. During that period over 700 names, representing more than a fifth of the membership of the Institute, had passed through the Appointments Register. At the present time, however, over 80 members were out of work, and many new recruits were joining the profession. He hoped that any member who had an opportunity of bringing a suitable appointment to the notice of the Institute would do so. In the present circumstances he felt that any man out of work would be wise to turn his hand to

anything which would assist him to earn his living. For some time it would be difficult for many men to secure what they thought they were worth in the way of pay, but they would rather have to make the best claim they could and take what they could get. The difficulty in chemistry lay in the circumstance that it was not a matter of assessing the value of craftsmen all capable of rendering services of approximately the same order, but of a body of men whose work could only be assessed with any degree of justice by taking them individually and in respect of a particular purpose. All professions were overcrowded; chemistry was perhaps in a better position than most; but it was impossible, in view of the varying nature of the work of chemists and their varying capabilities, to insist upon a minimum salary or to attempt to formulate a graded scale of salaries. Educated men were expected to prove their worth and their pay must be dependent upon individual ability and enterprise. Some he knew had for some time past led lives of quiet desperation. It was a hard task for them to hold out until better times, and already the Institute had received some calls on its Benevolent Fund. The Sections could help in that matter. The Council were indebted to Local Interviewing Committees and to individual members for their prompt replies to enquiries regarding candidates for membership. The Institute looks to the Local Sections to take a leading part in the election of the Council. By the election of District Members of Council it was hoped to secure strong representative members who would be keen to take an interest in the work of the Institute, and bring to the Council table new ideas for the furtherance of its work. To progress, the Institute should have the means constantly of attracting fresh ability and fresh views. He hoped that the meeting would decide that it was desirable to form a Section, and to put the matter in form, he suggested that a member should move that a Local Section of the Institute be formed.

Mr. Mackey moved, and Dr. R. B. Forster seconded, that there be formed at least one Local Section in the Yorkshire District. After some discussion as to the terms of the resolution, this motion was put to the meeting and carried.

On the motion of Dr. R. B. Forster, seconded by Mr. F. W. Richardson, it was resolved that it was desirable to form a Local Section at Leeds.

On the motion of Mr. Peacock, seconded by Mr. S. Robson, it was resolved that it was desirable to form a Section at Huddersfield, and, on the motion of Mr. W. J. Rees, seconded by Mr. John Evans, it was decided that it was desirable to form a Section at Sheffield.

Several members, including Messrs. F. W. Branson, J. A. Foster, J. H. Paterson, H. A. Scruton, and A. R. Tankard, took part in the discussion.

On the motion of Mr. Richardson, seconded by Mr. Young, a vote of thanks was accorded to Dr. Dunn for presiding, and, on a motion by Mr. J. A. Foster, a vote of thanks was accorded the Registrar for his attendance and assistance at the meeting.

Personal.

DEATH OF MR. EDWARD BEVAN.—The Council regret to report the death of Mr. Edward John Bevan, a Past Vice-President, who had rendered very valuable services to the Institute.

Mr. Alfred Chaston Chapman, F.R.S., President of the Institute, has been appointed a member of the Royal Commission on Awards to Inventors in place of Sir James Johnston Dobbie, Past President, who has retired from the Commission.

ERRATUM.—The Publications Committee regret that owing to a number of lines being accidentally omitted in the preparation of Part IV., the paragraph under this heading referring to Dr. P. C. C. Isherwood on p. 245 in that number was inaccurate. Two paragraphs should have appeared as follows:—

Dr. Percy Claude Cameron Isherwood has been appointed an Officer of the Order of the British Empire.

Dr. Eric Keightley Rideal has been appointed to the Humphrey Owen Jones Lecturership in Physical Chemistry in the University of Cambridge.

Obituary.

EDWARD JOHN BEVAN died suddenly at a nursing home, in London, on 17th October, in his sixty-fifth year. Before entering Owens College, Manchester, he was for four years in the laboratory of the Runcorn Soap and Alkali Co., during which time he attended classes at the Royal Institution, Liverpool. With this early experience he was transferred almost immediately to the Senior Laboratory at College, where he worked under Roscoe and Schorlemmer, taking physics under Balfour Stewart, and, two year later, in 1878, became chemist to Messrs. A. Cowan & Sons, Ltd., Papermakers, at Musselburgh. In 1882 he was engaged in the Jodrell Laboratory at Kew, upon research for Sir John Lawes, and subsequently investigated some chemical processes for Messrs. Thomson Bonar & Co. From his student days he was intimately associated with Mr. C. F. Cross, with whom he entered into formal partnership in 1883. In addition to the published researches on Cellulose, in which he was also associated with his partner, and which form a series of standard works of reference on the subject, Mr. Bevan was the author of special articles in Morley and Muir's edition of *Watts' Dictionary of Applied Chemistry*, in *Thorpe's Dictionary of Applied Chemistry*, and *Spon's Encyclopædia*, and of many papers contributed to scientific journals. He was also joint author with Mr. Cross of a *Textbook of Paper-Making*.

He was a member of the Juries of various exhibitions held in London in the eighties, and served as an Examiner to the City and Guilds of London Institute in several subjects. In 1892 he was appointed Public Analyst for the County of Middlesex, for which he was subsequently appointed Official Agricultural Chemist. He was an Hon. Secretary of the Society of Public Analysts from 1894 to 1904, and was President of that Society for the year 1905-06. He was elected a Fellow of the Institute in 1893, and served on the Council for four complete periods of three years each, and was a Vice-President from 1905-08.

He was buried in Watford Cemetery on 21st October, the Registrar attending as the representative of the Institute.

FRANCIS ALBERT BOWEN JEWSON died on January 4th, 1920, in his seventieth year. Trained at the Royal College of Chemistry under Sir Edward Frankland, he was for about twenty years chemist to Messrs. Gillman & Spencer, Brewers, of Southwark, and also taught in the London School of Brewing, then under the direction of the firm, before he practised on his own account. He was elected a Fellow of the Institute in 1888.

Books and their Contents.

[*Books presented by the authors or publishers, or purchased,† to be seen in the Library of the Institute.]

†“Aluminium and its Alloys.” C. Grard, translated by C. M. and H. W. L. Phillips. Pp. xxiii. and 184. (London: Constable & Co.) 17s. 6d.

Book I.: Aluminium. Part I., Production; Part II., Properties.

Book II.: Alloys of aluminium. Part III., Light alloys of aluminium for casting; Part IV., Light alloys of great strength; Part V., Cupro-aluminums or aluminium bronzes; appendices.

“Animal and Vegetable Fixed Oils, Fats, Butters and Waxes.” C. R. Alder Wright. 3rd edition, revised by C. Ainsworth Mitchell. (London: Charles Griffin & Co., Ltd.) 56s.

General composition and nature of oils, butters, fats, waxes, and allied substances; physical properties of oils, fats, waxes, etc.; chemical properties of oils, fats, butters, and waxes; processes used for extracting, rendering, refining, and bleaching oils, fats, etc.; classification and uses of fixed oils, fats, waxes, etc.; adulterations; the candle industry; the soap industry; appendices.

“Cane Sugar.” Noel Deerr. 2nd edition. Pp. 650. (London Norman Rodger.) 42s.

Cane; composition of sugar cane; range and climate; variation in the cane and cane varieties; soils of the cane-growing regions; manuring of the cane; irrigation of the cane; husbandry of the cane; pests and diseases; harvesting; extraction of the juice by mills; diffusion process; action of heat, alkalies and acids on sugars and cane juices; defecation of cane juice; carbonation processes: sulphitation; filtration; evaporation; sugar boiling and crystallization-in-motion; separation of the crystals; raw sugar; molasses; bagasse as fuel and the steam generating plant of the cane sugar factory; polarimeter; determination of cane sugar and the assay of sugar-house products; determination of reducing sugars; control of the factory; fermentation with special reference to the sugar house.

- *"Chemical Disinfection and Sterilization." S. and E. K. Rideal. Pp. vii. and 313. (London: Edward Arnold & Co.) 21s.

Disinfection of air; sterilization and preservation of food; sterilization of water; public disinfection; personal and internal disinfection; non-bacterial parasites; wood preservation; chemicals employed in disinfection—chemical constitution and germicidal activity; chemicals employed in disinfection—inorganic substances; chemicals employed in disinfection—organic substances; aliphatic derivatives; chemicals employed in disinfection—organic substances; aromatic derivatives; chemicals employed in disinfection—organo-metallic derivatives; methods of analysis and testing.

- *"Chemicals and Industrial Materials, with their Commercial Uses." C. Argles. (Birmingham.)

- *"Chemistry and Civilisation." A. S. Cushman. Pp. 151. (Edinburgh: E. & S. Livingstone.) 15s.

Chemistry in the past; chemistry in the service of man; chemistry and industry; chemistry and war; chemistry and the future; some modern aspects of chemistry.

- *"Chemistry and Physics, Handbook of." C. D. Hodgman, assisted by M. F. Coolbaugh and C. E. Senseman. 8th edition. Pp. 711. (London: Chapman & Hall.) 24s.

Mathematical tables; general chemical tables; properties of matter; heat; hygrometric and barometric tables; sound; electricity and magnetism; light; miscellaneous tables; definitions and formulæ; laboratory arts and recipes; photographic formulæ; measures and units; wire tables; problems.

- "Chemistry for Engineers and Manufacturers." Bertram Blount and A. G. Bloxam. 2 vols. (London: Charles Griffin & Co., Ltd.)

Vol. I., Chemistry of Engineering, Building and Metallurgy. 4th edition. Pp. xi. and 392. 14s.

Part I., Chemistry of the chief materials of construction; the sources of energy; steam raising; lubricants; Part II., metallurgy.

Vol. II., Chemical and Manufacturing Processes. 6th edition. Pp. xv. and 513. 16s.

Sulphuric acid manufacture; alkali manufacture; destructive distillation; artificial manure manufacture; petroleum; lime and cement; clay industries and glass; sugar and starch; brewing and distilling; oils, resins, and varnishes; soap and candles; textiles and bleaching; colouring matters, dyeing and printing; paper, pigments; manufacture of leather, glue and size; explosives, etc.

*"Explosives Supply, Technical Records of," 1915-18. Nos. 2 and 3. Ministry of Munitions and Department of Scientific and Industrial Research. (London: H.M. Stationery Office.) 30s. for 2 vols.

No. 2: Manufacture of Trinitrotoluene (T.N.T.).

No. 3: Sulphuric Acid Concentration.

*"Forensic Chemistry." A. Lucas. Pp. vii. and 268. (London: Edward Arnold & Co.) 15s.

Blood stains; bullets and other projectiles for firearms; clothing; counterfeit coins; documents; dust and dirt; explosives and explosions; fibres; finger prints; fires; firearms; hashish; microscopy and photography applied to forensic chemistry; poisons; preservation of the human body after death; robbery from letters and parcels; stains and marks; string and rope; textile fabrics; tobacco.

"Micro-Chemical Tests for Alkaloids, Some." Charles H. Stephenson. Pp. iv. and 110. (London: Charles Griffin & Co., Ltd.) 21s.

Micro-chemical tests for alkaloids—described by others; concentrations of alkaloidal solutions; reagents used; method used in making tests; scheme for identification of tests; table showing tests for each alkaloid; detailed description of tests; chemical examinations; 27 plates.

*"Modern Chemistry." A. J. Hale. Vol. III. Pp. vi. and 280. (London: Virtue & Co., Ltd.) 16s.

Historical and general introduction to the chemistry of carbon compounds; hydrocarbons, aliphatic and cyclic; halogen compounds, organo-compounds of metals and non-metals; alcohols, fermentation, ethers; aldehydes and keto-compounds; carboxylic acids and their derivatives.

"Physical Chemistry, System of." W. C. McC. Lewis. 3 Volumes. (London: Longmans, Green & Co.)

Vol. I. Pp. x. and 494. 15s. The kinetic theory.

Vol. II. Pp. iii. and 454. 15s. Thermodynamics.

Vol. III. Pp. viii. and 209. 7s. 6d. Quantum theory, Appendices.

"Physiology of Protein Metabolism." Monographs of Bio-Chemistry. E. P. Cathcart. New edition. Pp. vii. and 176. (London: Longmans, Green & Co.) 12s. 6d.

Digestion of protein; protein regeneration; feeding experiments; deaminization; influence of food on the composition of the tissues; protein requirements; theories of protein metabolism; starvation; work; influence of carbohydrates and foods on protein metabolism; bibliography.

"Qualitative Analysis, Notes on." H. J. H. Fenton. New edition. Pp. vi. and 153. (Cambridge University Press.) 9s.

"Qualitative Analysis of Inorganic Substances, Text-book of." S. A. Kay. Pp. vi. and 80. (London: Gurney and Jackson.) 7s. 6d.

*"Radioactivity and Radioactive Substances." J. Chadwick. Pp. xii. and 111. (London: Sir Isaac Pitman & Sons, Ltd.) 2s. 6d.

Nature of radioactivity; ionization of gases; methods of measurement; radiations; the α -rays; the β - and γ -rays; radioactive changes; radioactive substances; radium and its products; general results.

*"Soil Conditions and Plant Growth." E. J. Russell. Pp. xii. and 406. 4th edition. (London: Longmans, Green & Co.)

History; soil conditions affecting plant growth; composition of the soil; colloidal properties of soil; carbon and nitrogen cycles in the soil; biological conditions in the soil; micro-organic population of the soil and its relation to the growth of plants; soil in relation to plant growth; soil analysis and its interpretation; appendices.

Scientific and Industrial Research.

The Sixth Annual Report of the Committee of the Privy Council for Scientific and Industrial Research (Cmd. 1491), recently published by H.M. Stationery Office, covers the twelve months ending 31st July, 1921.

Referring to the work of the boards which have been established to co-ordinate, in the interests of economy, researches which are of civilian interest as well as of importance to the fighting services, the Committee state that

“In view of the Government instructions with regard to the restriction of public expenditure, it has been necessary to proceed with caution in expenditure on new researches and, in view of the difficulty of securing research workers of high qualifications and of introducing a new and experimental system of co-operation between different departments of State, the progress has inevitably been slower than will be the case after experience has been gained and time has been given for working out a well-considered programme.”

Seeing that, as a result of the prevailing industrial depression, a considerable number of highly competent chemists are now available, the difficulty of securing research workers is hardly apparent, so far as chemistry is concerned, although the desire to restrict public expenditure may so affect the terms offered to them as to induce them to seek employment in other directions.

The Report of the Committee deals in the main with the disposal of funds and bears evidence to the anxiety of the Department to restrict expenditure, although it

“will inevitably involve the postponement of a certain amount of research work which we consider of importance in the national interest, while over the whole programme of work of the Department its effect will be to retard progress and to delay the stage at which results will become available.”

A sum of £14,202 has been provided, in the estimates for 1921-22, for the Building (materials and construction) Research Board, including about £3,000 for the Building Research Station. The estimated expenditure on the Geological Survey and Museum is £65,711, provision being made for £12,000 in respect of the printing establishment of the Ordnance Survey on the engraving and printing of Geological Survey maps, in accordance with a decision that this service shall in future be rendered by the Ordnance Survey on a repayment basis.

“Important work has been undertaken during the year by the Fuel Research Board.”

A Report has been published on the effect of steaming various coals in vertical gas retorts.

“The results show broadly that substantial gains can be made in the gas evolved, and also in the by-products, tar and sulphate of ammonia. A report will shortly be issued dealing with the experiments on low temperature carbonisation and the carbonisation of air-dried peat at various temperatures.* Inquiries have been prosecuted in Canada in connexion with peat winning, and experimental work has been carried out in Ireland at Turraun. Research work on power alcohol has also proceeded actively.”

Provision has been made in the estimates for 1921-22 for an expenditure of £54,979 on the Fuel Research Station, with receipts estimated at £6,600. The expenditure elsewhere than at the Fuel Research Station is estimated at £7,985.

“The total estimated expenditure of the National Physical Laboratory in 1921-22 is £213,269, and the estimated receipts amount to £101,000, of which £50,900 represents fees paid by outside bodies for tests and special investigations, while £50,100 represents research undertaken for other Departments of State on a repayment basis.”

The most important development of the work of the Food Investigation Board during the past year has been the

* Fuel Research Board. Technical Paper No. 4. The Carbonisation of Peat in Vertical Gas Retorts, H.M. Stationery Office, 6d. (by post, 7d.).

establishment of the relations with the University of Cambridge, and the decision to proceed with the erection of a Low Temperature Research Station on a site provided by the University. A grant of £35,500 has been made to the University for the erection and equipment of the Station. For the continuance of the present work of the Board a sum of £23,318 has been included in the estimates of the current financial year.

The Tin and Tungsten Research Board, having brought its labours to a definite stage, has been dissolved. The balance of its Research Fund, provided by the Cornish landowners and mine owners, amounting to £393 8s. 6d., has, after adjustment of certain expenditure on patents taken out to cover the results of research carried out by the Board, been transferred to the Cornish Chamber of Mines for the prosecution of research for the benefit of the tin mining industry.

Thirteen other research programmes have been carried out under the supervision of various committees of the Department during 1920-21, at a cost of £12,881 13s. 6d.

The number of industrial research associations now approved by the Department is twenty-six, and the total expenditure on grants to associations during the year ended 31st March, 1921, amounted to £74,557 1s. 2d. The balance of the Million Fund remaining unexpended was £903,205 8s. 10d. of which sum a large percentage has been earmarked for prospective commitments to associations already formed.

Twenty-four applications for patents have been filed during the past year, of which five were not proceeded with.

Eighteen grants were made in aid of scientific investigations conducted by other bodies at an expense of £20,912 3s. 11d., and a sum of £8975 has been provided for their continuance. Allowances have also been made to 132 students for training in research in various universities and colleges, and to 70 research workers engaged on independent research or as scientific assistants to investigators of standing, besides 43 grants to scientific workers to enable them to employ laboratory or clerical assistants or to purchase equipment.

The total amount expended on these grants is estimated at £40,850, compared with £23,655 5s. 9d. in the previous year.

The total expenditure of the Department was £552,219 7s. 5d.

The Report of the Advisory Council, which is attached to the Report of the Committee, occupies the bulk of the publication.

The Council state that they have recommended reductions of 17 per cent. in expenditure during 1921-22, and that their preliminary estimates for 1922-23 show a saving of 20 per cent. on those of the current year, but they urge upon the Privy Council and the Government

“the danger that, if the financial provision for research is severely cut down, it may be necessary to suspend the existence of certain organisations under the Department whose investigations could not be satisfactorily continued within narrower limits of expenditure than are imposed at present. Not only would such a step seriously diminish the usefulness of the Department, but an attempt to renew these activities when times are more prosperous would involve much labour and difficulty, and, when completed, might be too late to be effective.”

The Report continues: “Scientific research is, in our judgment, the main, if not the only, source of fresh productivity in industry, and it is only by increased productivity the world will find a way out of its present economic difficulties.”

With regard to the opinion of the Committee of the Privy Council that there are few suitable research workers available, an opinion which it is difficult to reconcile with the fact that, at the date of the report, a considerable number of such workers were actually disengaged, it might be held that the following quotations should justify an effort to secure their further employment:—

“The real limit that should be set to work of this kind is the number of suitable workers available, for it is clear that

men capable of independent scientific research always produce more than they cost." "If efficient research workers can be employed on a problem that calls for solution, it always pays to employ them. If they cannot, it is useless to undertake the work, and we have repeatedly refused to begin important researches for this reason. That is the principal argument for spending State funds on recruiting and training an army of research workers of the necessary attainments. They are needed not only by the State for attack upon urgent problems; they are needed also by our industries as a means to higher production and by the universities as leaders and trainers of fresh recruits." "Any reduction in the expenditure by Government on research which is considered by responsible men of science to be needed will react most rapidly at the point where we are nationally weakest—on the number (not the quality) of competent investigators coming forward."

Co-ordinating Boards have been appointed with the following duties:—

- “(a) To co-ordinate the researches of the fighting services and other Government Departments with a view to securing greater efficiency and preventing overlapping.
- (b) To form a central source of finance for researches of general industrial and scientific importance.
- (c) To act as a source of information on the results achieved to other interested persons, so far as this is consistent with the safety of the realm.
- (d) To arrange for researches for which inadequate provision is made.”

The Boards asked for returns of the various experimental establishments, of the facilities available at each, and of the personnel engaged in directing and carrying out scientific research, and for complete lists of the researches in progress, with the useful results of enabling a comprehensive view of the requirements of the services to be obtained, and of suggesting opportunities for mutual co-operation and help. More

complete knowledge was obtained by visiting experimental stations in order to get into closer personal contact with the officers who are carrying out the work. Visits were paid to the National Physical Laboratory, to a section of the Royal Arsenal, Woolwich, and to the different sections of the Research Department, Woolwich, to the Admiralty Engineering Laboratory and the Admiralty Mining School, to the Signals Experimental Establishment, Woolwich, and to the Royal Aircraft Establishment, and in every case the responsible officers made admirable arrangements to give members of the boards a clear idea of the scope and character of the work being carried out.

The results showed that in the strict sense there was remarkably little overlapping in the researches conducted by the different services, and that where the same problem was apparently being attacked at different establishments, closer enquiry showed that it was being attacked from different points of view. It was not sufficient, however, to be satisfied that no unnecessary overlapping existed—the really vital question being whether the arrangements were such as to secure maximum efficiency and economy.

“Arrangements have been made to finance researches undertaken at the National Physical Laboratory for the fighting services which are approved by the boards, and for which provision could not be made in the general annual estimates of the Laboratory. It has been arranged that researches undertaken for other Government Departments at the National Physical Laboratory which are not referred to and approved by the boards are to be financed by the Department initiating them.”

With regard to the publication of the results of investigations undertaken for the services, the Advisory Council advocate a policy under which the co-ordinating research boards will advise on the suitability of publication or other communication, rather than that the boards should undertake it themselves.

On the other hand, the Council recognise the importance

of entrusting the boards, so far as is possible, with the duty of arranging directly for the communication of confidential information on the results of research to industrial organisations, when this appears desirable in the interests of the services. The reason for this is mainly that the Research Department is in far closer touch, through research associations and in other ways, with the general scientific activities of the country.

"The ultimate aim of most Government research carried out for the fighting services is to improve an article for the benefit of the services as users; sooner or later, therefore, the results must be communicated in some form to the producers. Since this is necessarily true, the best method of doing so is a matter of great importance to which the boards will continue to give careful attention."

It is admitted that many technical developments of the fighting services are initiated by people who are entirely independent of the services and that big developments in any branch of knowledge often come by following up lines of thought with quite a different object in view.

The Council is mindful also of the importance of developing methods for the production, from material available in the country, of substances which may be of vital importance in war time, and this they suggest is essentially a matter for Government initiative, since there can be little incentive on the part of the industries of the country to embark on technical developments.

The remainder of the Report is divided into three parts: (1) recording progress made with the scheme for co-operative research by the industries, (2) recording work done for national purposes, and (3) referring to "(a) certain independent institutions and certain specific researches which have been aided by grants from the Department; (b) the grants made to individual research workers and students; (c) the Inter-departmental Committee on Patents; (d) the question of State aid to the publications of learned societies; and (e) the method of dealing with applications for aid from inventors."

The total number of research associations established up to the date of the Report is twenty-four, and two others are about to be incorporated.

Some of the associations have not as yet produced any large amount of new knowledge, but others are said to have already done work which will repay their expenditure. While there is a tendency to attach much importance to early practical results, the associations are concentrating more particularly on the fundamental principles underlying the methods and processes of their trades.

The British Cotton Industry Research Association, for example, in its investigations has determined its line of advance: "To try to understand the chemical and physical changes produced during manufacture, and so to establish gradually, a broad roadway along which future advances may be made." Work is in progress on "The structure of cotton fibre; the effects of bacteria in causing deterioration of cotton and cotton goods; the constituents of raw cotton; the moisture content and drying of cotton, defective sizing, the variation of tensile strength with twist, measurement of the regularity of yarn, strength of yarns under a varying stress."

The Association will have its laboratories at the Shirley Institute, Didsbury, and it is anticipated that the first portion will be ready for occupation in December this year. The Association has prepared a comprehensive bibliography relating to the cotton industry, and has a rapidly growing library.

The British Research Association for the Woollen and Worsted Industries has been occupied largely in the equipment of an establishment at Headingley, Leeds. It has issued several reports on various researches, other investigations are in progress, and the Association is consulted on difficulties susceptible of solution by research, as they arise. The investigations are carried into the question of improving the quality of raw wool as affected by breeding; and the co-operation of sheep farmers and flock-owners has been sought in that connection.

The Linen Industry Research Association, which is to be housed at Lambeg, near Belfast, is devoting attention to a wide field of problems of technical importance, such as work in connection with the selection of improved strains of seed, in order that general uniformity may be secured in the flax crop and in the fibre resulting therefrom. Experimental flax-growing has been carried out in the grounds of the research institute, and other experimental plots of flax of different varieties have been grown by the Association for the purposes of supplying the laboratories with raw material for research and for seed selection. The comparative study of flax, hemp, and ramie has been commenced, including the behaviour of the raw materials when "retted," and the changes taking place during the process of "boiling" and "bleaching."

The Research Association of British Rubber and Tyre Manufacturers has been temporarily accommodated at University College, London, but has lately purchased premises in Croydon. Pending the installation of the experimental equipment of the permanent laboratory, the scientific work has been limited to investigations of a physical character bearing on the properties of crude rubber and the changes resulting from the preparatory processes employed in the factory. The results of these investigations are expected shortly.

The British Photographic Research Association, which occupies part of the Laboratories of the Institute, has devoted its attention to work of a fundamental character, and in order to make its results widely available has published a considerable number of communications to scientific and technical journals, in the belief that the wide dissemination of results will stimulate interest in its activities and secure more widespread co-operation in its work.

The British Scientific Instrument Research Association, which is also in Russell Square, has carried out investigations on abrasives and polishing powders, which have proved of interest to the British Non-Ferrous Metals Research Association and the British Cutlery Research Association; and

provisional arrangements have been made for joint action in the future conduct of research. A Sub-Committee of the Association has been appointed to co-operate with the Electro-therapeutic Section of the Royal Society of Medicine to draw up a complete specification of an X-Ray outfit to comply with modern requirements. The Association has also found it expedient to consult with the Director of Research of the British Electrical and Allied Industries Research Association and to arrange for co-ordination in electrical researches of common interest to both organisations. Close touch has been maintained between the Association and the research departments of the fighting services, and to further this policy three officers, nominated respectively by the Admiralty, War Office, and Air Ministry, have been appointed to the Council of the Association.

The British Refractories Research Association at Stoke-on-Trent has taken over from the Institution of Gas Engineers all the research work hitherto carried out by the Institution, and has formed a Joint Committee with the Glass Research Association for the purpose of dealing with special problems encountered in the Glass Industry.

The Advisory Council have without doubt made special mention of the above Associations as representing types of the more active of these organisations. All of the Associations referred to above employ chemists, whose work will therefore be watched with interest by members of the Institute.

The following paragraphs under "General Considerations" are also of interest:—

"In last year's report, the question of associations undertaking for their members work of a kind hitherto carried out by the professional analyst or testing engineer was discussed, and we pointed out that it was important that research associations should define clearly, and from the beginning, their attitude in this matter. The subject was raised at one of the conferences of research associations held by the Department, and distinctly different policies were advocated. The view was expressed by one association

that consulting work was of definite value to the progress of research, inasmuch as it kept the association informed of the directions in which research was desirable, owing to customary methods being unsatisfactory; it also brought out the need for educational lectures and better dissemination of known practice. It was further argued that in all research work the irregular or unexplained result was often the starting point for important advances."

"Another association, on the other hand, felt that research should, as a rule, be carried only to the initial stage of practical application, the individual firms being left to work out the methods of applying the new knowledge to their own particular problems, and that only in exceptional cases should it be carried beyond this point. In support of this view, it was argued that it would tend to foster the demand for the services of scientific men in the works of individual members of research associations."

The argument appears to have drifted swiftly away from the point at issue, viz., whether state-aided institutions should interfere with the right of rate- and tax-paying citizens to earn their livelihood; but it is gratifying to find that the Advisory Council adopt a view which leaves at least some possibilities for the individual practitioner. They say:—

"We recognise that individual associations must work out for themselves the problem of combining pure research with an intimate knowledge of the conditions of industrial practice, but we are of opinion that, as the individual firms in an industry come to grasp the importance of research and experiment in the conduct of their own business, the second view will be held to be the sounder, and that research associations will decide to keep in the forefront of their policy the vital importance of the investigation of fundamentals."

The National Physical Laboratory has resumed its normal functions and its work continues to increase in scope and importance.

"The researches on alloys in continuation of the work of

Roberts Austen, which have been carried out at the Laboratory since its formation, under the auspices of the Alloys Research Committee of the Institution of Mechanical Engineers, are still in hand. Research on hardness of metals and their resistance to wear is also in progress for the same institution. The Laboratory has co-operated with the Iron and Steel Institute in the production of standard steel samples, and has given assistance in the work of the Institute of Metals. Investigations in hand for the British Electrical and Allied Industries Research Association, the Glass Research Association, the British Non-Ferrous Metals Research Association, the British Scientific Instrument Research Association, etc., cover a wide field. The demands from manufacturers for special investigations continue to increase, and indicate widening recognition of the assistance which the Laboratory is able to render. The Laboratory receives payment of the full cost of all work done for research associations or private firms."

"Extended use is being made of the Laboratory in the conduct of research required by the boards and committees of the Department, including the co-ordinating research boards."

"The volume of test work has somewhat diminished, owing partly, no doubt, to general industrial depression, and in part also to the diminished needs of the service departments."

"It has been necessary to revise generally the fees charged for tests in order to cover the increased cost of the work."

"A general account of the more recent research work will be found in the report of the Laboratory for the year 1920."

Following a brief reference to the Geological Survey Board, the Report deals with the work of the Fuel Research Board,[†] to which special reference is also made in the Report of the Committee of the Privy Council (see p. 301)."

* National Physical Laboratory, Report for the year 1920. Published by His Majesty's Stationery Office. Price 5s. net.

[†] Report of the Fuel Research Board, for the years 1920—1921. First Section: Steaming in Vertical Gas Retorts. Published by H.M. Stationery Office. Price 1s. 6d. net.

A beginning has been made in collecting and collating existing information as to the distribution and qualities of the coal seams of Great Britain from the fuel point of view.

"Particulars of the seams of the Yorkshire, Nottinghamshire and Derbyshire coalfield have been collated and will be published at an early date."

Further provision has been made in respect of inquiries into some of the problems of domestic heating which are being undertaken by Dr. Margaret Fishenden for the Manchester Air Pollution Board, and by Mr. A. H. Barker for the Building Materials Research Committee.

The Fuel Research Board have issued a special report on the findings of the Irish Peat Inquiry Committee.* Seventy tons of peat have been used at the Fuel Research Station, Greenwich, in practical experiments on carbonisation at low temperatures, and in vertical retorts at higher temperatures. It has also been used directly as a fuel in the Babcock experimental boiler. The results obtained are of an encouraging character and details of the work are to be published.

Experiments on the cultivation of Jerusalem artichokes are being continued with the object of growing them as a source of alcohol for special purposes, and utilising the stems in the form of paper pulp. Investigations are also in progress in the Overseas Dominions and Colonies where labour is obtainable with a view to possible supplies of alcohol and light liquid fuels from other suitable crops. The Department has made a grant to the Empire Motor Fuels Committee in aid of research, now being carried out by its Engineering Sub-Committee, in connexion with the use of alcohol and mixtures of alcohol with other liquid fuels in internal combustion engines.

In connection with the work of the Food Investigation Board, a low temperature station for research in bio-chemistry and bio-physics, which is in course of erection upon a site

* The Winning, Preparation, and Use of Peat in Ireland. Reports and other documents. Published by H.M. Stationery Office, 1921. Price 3s. net.

provided by the University of Cambridge, near the new biochemical laboratory and the laboratories of agriculture and of botany, is expected to be ready for work by the end of the year. The Fish Preservation Committee have published an interim report upon the results of their investigations on the brine freezing of fish.* A report by Prof. W. Stiles upon the general theory of the preservation of food by cold is in the press, and other reports on the preservation of meat are noted, as is also the work of Committees concerned with Fruit and Vegetables and with Canned Foods.

Under the Building (Materials and Construction) Research Board, the methods of preserving English building stones are being investigated with the help of Dr. Desch. Work has been done for the authorities of Westminster Abbey and the Imperial War Graves Commission on this subject. At the Board's request, the British Engineering Standards Association are considering standards for the sand-lime brick and iron Portland cement.

A Forest Products Research Board, of which Mr. A. Chaston Chapman, President of the Institute, is a member, has been appointed to organise and carry on research into the utilisation of timber and other forest products:—(i.) wood technology, including the testing, seasoning, and preservation of timber; (ii.) investigations into forest products other than timber.

Under the Chemistry Co-ordinating Research Board arrangements have been made for investigating the possibilities of the production of formaldehyde in this country, in view of its importance in the manufacture of disinfectants and high-class insulating materials, and of the fact that supplies are at present almost entirely imported or made from imported materials. The desirability of further Government research into the problems of nitrogen fixation has been considered; in

* Food Investigation Board, Special Report No. 4. Interim Report on Methods of Freezing Fish, with special reference to the Handling of Large Quantities in Gluts. Published by H.M. Stationery Office, 1920. Price 1s. 6d.

the Board's opinion no further action is necessary at present, but the general position is being kept under review.

A joint research is being undertaken by the British Scientific Instrument Research Association and the National Physical Laboratory into luminous paints. Many of the problems confronting the Chemistry Board have already been engaging the attention of the Government Laboratory, and assistance has accordingly been given to the Board by officers of the Laboratory.

The Adhesives Research Committee have been re-appointed and strengthened by the addition of representatives of the fighting services. The investigations are being continued at the Imperial College of Science and Technology, being chiefly concentrated on the problem of the production of glues and cements from animal sources. Work is also proceeding on the production of adhesives from vegetable sources. A process has been evolved for the production from the oil-free residues of castor beans, and other oil seeds, of an adhesive of good general quality, and it has been found possible to utilise the process in the manufacture of plastic materials and distempers. The Building Research Board is co-operating in this work.

Researches on liquid oxygen are continuing, and a handbook on Oxygen and Liquid Air is being prepared, in which will be embodied an account of the general methods of production, applications and uses of oxygen.

Dr. Alexander Scott has continued his work for the authorities of the British Museum in the solution of the technical problems connected with the preservation and restoration of antique objects, special mention being made of the successful treatment of discoloured drawings, engravings, and etchings, the preservation of enamels, and of metallic objects. Dr. Scott is preparing his results for publication.

Most of the functions which the Standing Committee on Metallurgy might be expected to perform have been taken over, or are likely to be taken over, by research associations for the industries concerned.

In Part III. of the Report of the Advisory Council reference is made to grants to the Department of Glass Technology in the University of Sheffield, the Department of Technical Optics in the Imperial College of Science and Technology, and the School of Science and Technology, Stoke-on-Trent.

At the Institute of Glass Technology in the University of Sheffield, Prof. Turner and his collaborators have continued investigations concerned with the correlation of the physical properties of different glasses with their chemical composition. Thus, the subjects of the researches have included:—The density of soda-magnesia glasses, the influence of silica and of alumina on the annealing temperature of glass, the effect of silica and sodium oxide on the thermal expansion of glass, the optical properties of sodium-aluminium-silicate glasses, the influence of alumina on the general properties of glass, and the discolouration produced by lead, antimony and arsenic in lampworked glass tubing. Prof. Turner has also turned his attention to the composition and properties of fire-clays and china clay in their relation to the glass industry.

The Advisory Council express the hope that the Department of Technical Optics at the Imperial College of Science and Technology, which is partly of an educational character, will result in the creation of a personnel, adequate in numbers and scientific training, for the optical instrument industry.

The results of investigations undertaken under the auspices of the Society of Dyers and Colourists have been published in the *Journal of the Society*. The technical importance of rosin has led to an extensive chemical examination of French and American samples of this complex material. Optically active pimaric acids of opposite rotation were obtained from the respective samples. Derivatives of the pimaric acids have been prepared, and these throw some light upon the chemical constitution of the original rosin.* The investigation of the constituents of raw cotton has been continued by Prof. Knecht, and, after tracing the fate of the nitrogenous constituent of the fibre during the bleaching process, attempts

* Knecht and Hibbert, *J. Soc. Dyers and Col.*, 1919, 35, 148.

have been made to obtain further information by extracting raw cotton successively with various solvents.* Mr. Higgins has conducted a parallel research upon the elimination of nitrogen from fibres generally in the course of the bleaching process.† Mr. Radcliffe has also continued his work upon the action of nitric acid on saponifiable oils.

Valuable results are being obtained in the investigation carried out under the direction of the Corrosion Research Committee of the Institute of Metals of the corrosion of condenser tubes. A Sub-Committee, on which the fighting services are represented, will also investigate the corrosion of aluminium and its alloys primarily for the special purposes of the Air Ministry.

The past year has witnessed the steady growth of the system of grants to individuals, which is attributed to the more widespread knowledge and appreciation in universities and colleges of the grants of the Department, and the completion of their degree courses by the large number of ex-Service students to whom assistance has been given by the Board of Education. The system is not intended to be complete in itself, but is designed to supplement, and not to supersede, existing provision, whether national or local, for post-graduate research in science.

Considerable changes have been made in the administration of the grants during the past year. The most important of these changes relates to the publication of the results of research. It will now be open to everyone in receipt of grants to publish his results as he may think best, so long as he does not propose to make any commercial use of them by patent or otherwise, for it is considered of the utmost importance that new scientific knowledge should be made available as widely as possible.

From time to time the Advisory Council have received requests that research workers and students-in-training

* Knecht and Fernandes, *J. Soc. Dyers and Col.*, 1920, 36, 43.

† Higgins, *J. Soc. Dyers and Col.*, 1919, 35, 165.

should be allowed to undertake a certain amount of demonstrating or other teaching work. They are prepared to sanction teaching work in suitable circumstances, provided it is properly remunerated: it is no function of the Department to provide any part of the necessary staff, or to remit, for the benefit of the university or college, payments that otherwise would be made of necessity.

The Council are sometimes asked to make grants-in-aid of the publication of particular scientific papers, and especially in relief of the cost of preparing plates in illustration of them; but they wish it to be known that the grants of the Department to individuals are not available for such purposes.

The Advisory Council have also received further applications from Learned Societies for assistance in publication, and on this subject they have been unable to modify the views expressed in their previous report. "We would also point out that a Treasury grant, if it could be secured, would not only have the advantage of preserving the autonomy of the societies in their control of scientific publications, but, as compared with assistance from this Department, would be available for the whole field of scientific work, and not merely for that considerable portion of it which falls within our purview."

Applications have also been received from inventors. In a large number of cases, the assistance which they desire is for the exploitation of their inventions rather than for research required to perfect for commercial use a suggestion or idea for an invention; such applications fall outside the province of the Department. The Council suggest that the research associations may be more successful in encouraging inventors than a Government Department, and where they have received an application for assistance in connection with an invention which appears likely to be of interest to some industry which has established a research association, they have, as a rule, referred the applicant to that body.

The cases of useful discoveries which cannot be dealt with either by an industrial research association or in connection with research undertaken for the Government services, and which, therefore, will still fall to the Department for consideration, will be few in number, judging from past experience; but the Advisory Council will be ready to consider application for assistance in research required to perfect for commercial use a new scientific discovery or invention. In dealing with such applications they require, as a rule, that the invention must first be patented or protected, and, before recommending assistance from public funds, they expect the discoverer to enter into an agreement with the Department as to the terms on which his invention may be exploited.

A number of appendices useful for reference purposes are also included in the publication.

General Notices.

Examinations.—Examinations for the Associateship and Fellowship will be held at the Institute during the weeks commencing on the 2nd and 9th January, 1922.

Candidates who desire to be examined in January must notify the Registrar before Monday, 28th November, 1921.

Notice to Associates.—Associates elected prior to October, 1918, who can produce evidence satisfactory to the Council that they have been continuously engaged in the study and practical applications of chemistry for at least three years since their election to the Associateship, can obtain from the Registrar particulars of the Regulations and forms of application for election to the Fellowship.

Appointments Register.—A Register of Fellows and Associates of the Institute of Chemistry who are available for appointments is kept at the Offices of the Institute. For full information, inquiries should be addressed to the Registrar.

Fellows and Associates are invited to notify the Institute of suitable vacancies for qualified chemists.

Registered Students in the last term of their college course may receive the Appointments Register of the Institute on the same terms as Fellows and Associates, provided that their applications for this privilege be endorsed by their Professor.

The Institute also maintains a Register of Laboratory Assistants who have passed approved Preliminary Examinations and, in some cases, Intermediate Science Examinations. Fellows and Associates who are able to offer vacancies to such assistants are invited to communicate with the Registrar.

A number of Registered Students of the Institute desirous of gaining practical experience will be glad to have opportunities of working in private laboratories or works during vacations.

The Library.—The Library is open for the use of Fellows, Associates and Registered Students, between the hours of 10 A.M. and 6 P.M. on week-days (Saturdays: 10 A.M. and 2 P.M.) except when examinations are being held.

Registered Students using the Library are informed that the Assistant Secretary may be consulted by those who desire advice with regard to books on subjects in which they are specially interested.

The Library of the Chemical Society is also available for the use of Fellows and Associates of the Institute wishing to consult or borrow books, from 10 A.M. to 9 P.M. on week-days (Saturdays from 10 A.M. to 5 P.M.).

Changes of Address.—In view of the expense involved through frequent alterations of addressograph plates, etc., Fellows, Associates, and Registered Students who wish to notify changes of address are requested to give, as far as possible, their *permanent* addresses for registration.

THE 321
INSTITUTE OF CHEMISTRY
OF
GREAT BRITAIN AND IRELAND.

FOUNDED, 1877.
INCORPORATED BY ROYAL CHARTER, 1885.

JOURNAL AND PROCEEDINGS.
1921.

PART VI.

Issued under the supervision of the Publications Committee.

RICHARD B. PILCHER,
Registrar and Secretary.

30, RUSSELL SQUARE, LONDON, W.C. 1.
December, 1921.

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Proceedings of the Council.

(October—November, 1921)

Instruction and Examinatoins in Chemistry in Technical School.—The Board of Education have now published particulars of the Scheme referred to in the Journal, Parts IV. and V., arranged with the Institute for the award of Certificates in Chemistry and Applied Chemistry to students in Technical Schools and Colleges in England and Wales (Rules 100, obtainable from the Board of Education: 2d.). The Scheme will come into operation shortly.

Conference on Scientific Glassware.—At a conference on the Standardisation of Glassware, convened by the Director of the National Physical Laboratory, and held at the Department of Scientific and Industrial Research on October 20th, the Institute was represented by the President, with Sir Herbert Jackson (Vice-President), Mr. E. W. Voelcker (Hon. Treasurer), Dr. J. J. Fox, and the Registrar. The conference was also attended by representatives of the Chemical Society, the Society of Chemical Industry, the Society of Public Analysts, the Society of Glass Technologists, representatives of the Department of Scientific and Industrial Research, of the National Physical Laboratory, of medical authorities and of manufacturers' associations.

Sir Joseph Petavel, Director of the National Physical Laboratory, who presided, and Mr. J. E. Sears, of the Laboratory staff, having outlined the subjects to be submitted for consideration, the conference proceeded to discuss the desirability of providing two grades of scientific glassware.

The general opinion was that while high quality graduated glassware suitable for the most accurate work should certainly be available, there should also be second quality apparatus, not necessarily of the highest accuracy, but sufficiently reliable for use in ordinary commercial operations, and suitable for use by students in universities, colleges and schools. This second quality apparatus represented the bulk of the apparatus in daily use, and was referred to as "commercial grade" volumetric glassware.

The Chairman, in outlining a suggestion put forward by the National Physical Laboratory, pointed out that it was essential to the success of any scheme for guaranteeing the standard of accuracy of British goods, that it should not involve any considerable increase in the price of commercial grade glassware. The Laboratory had definite Treasury instructions that the cost of carrying out test work must be met from the fees received. The fees charged by the Laboratory were governed by this fact, and no reduction was possible. The cost of carrying out tests was a serious problem so far as commercial grade glassware was concerned. It was with a view to minimising this cost that it had been suggested that manufacturers should guarantee their commercial grade glassware as accurate within the existing N.P.L. Class B limits (or other agreed standard of accuracy for commercial ware), and undertake to replace any piece of apparatus failing to come up to such standard by apparatus tested at the National Physical Laboratory and bearing a mark signifying that it satisfied the requirements for commercial grade apparatus. Such a procedure would give confidence to the users and involve only a small expenditure in test fees at the Laboratory. A possible alternative was the establishment of a test house run by the manufacturing firms.

In the subsequent discussion, the conference appeared to concur in the view that if the manufacturers saw no objection to guaranteeing their own goods, and the National Physical Laboratory thought that was a reasonable procedure, it would be preferable to establishing a second standardising

institution; and, further, that a standard mark should only be put on by a national or quasi-national institution.

After summarising this part of the discussion, the Chairman said that the suggestion which still remained before the meeting was the provision of some system of guarantee by the makers, coupled with the provision of tests at the National Physical Laboratory, specially designed for commercial grade ware, which would provide a ready means whereby users and manufacturers alike could ascertain whether the guarantees were being fulfilled.

The Chairman then submitted a suggestion from the National Physical Laboratory that it would be desirable to form a permanent committee to deal with matters relating to the standardisation of glassware; the idea was to secure permanent co-operation between users, manufacturers, dealers, and all interests concerned. Useful work which the committee might undertake would be to formulate proposals as to the standard sizes, shapes, etc., of apparatus to be placed on the market. Questions as to the standard to be attained by commercial grade volumetric glassware might also usefully be considered by this committee. Frequently, the National Physical Laboratory would like to confer with some authoritative body with regard to proposed alterations in test regulations, the introduction of new regulations, etc. It was not convenient to call a general conference whenever such points arose. The proposed committee would deal with such points. Such questions as establishing uniformity of procedure on a scientific basis, e.g. the most suitable unit of volume for general use, uniformity of density or specific gravity tables, etc., might be dealt with.

The Chairman asked if the formation of such a committee were generally approved by the meeting. This approval having been signified, the question of the constitution of the committee was considered. The Chairman thought that representation of all interests in the country should be ensured, so that the committee would have considerable influence behind it, and its decisions be widely respected. Thus the

complete body would unavoidably be large, but this drawback could easily be overcome by the members working in small panels. The full committee would not meet frequently, but would meet to appoint sub-committees, and afterwards periodically to receive reports of these sub-committees.

It was agreed to ask each of the bodies taking part in the conference to appoint representatives on the new committee, and a few others were added to the list.

It was agreed that the Chairman should circularise the various bodies informing them that the present meeting had agreed that a committee should be formed, and asking them to appoint representatives. On receipt of nominations the Chairman would make arrangements for the first meeting of the new committee, at which a programme of work could be decided upon, and officers and sub-committees appointed.

Some general discussion took place on the subject of units of volume. Opinion was sharply divided between (*a*) the universal use of the litre, and (*b*) the use of Mohr's system for commercial grade apparatus in addition to the use of the litre.

The matter was finally left for the consideration of the new committee.

The Chairman thanked the representatives for attending the conference, and the proceedings then closed.

Mr. A. Chaston Chapman (President) has since been appointed, and has consented to act as representative of the Institute on the newly-formed Standing Committee to deal with the Standardisation of Scientific Glassware and kindred problems.

Pharmacy Acts Amendment Bill.—The Legal and Parliamentary Committee have considered a Bill presented in Parliament and ordered to be printed 3rd November, 1921, "To regularise the position of all persons trading as chemists and druggists or pharmacy store proprietors in the sale of drugs, the dispensing of doctors' prescriptions, and the sale of patent medicines." The Bill was presented by Capt. James

O'Grady, supported by Col. D. Watts Morgan and Mr. Thomas W. Casey.

Neither the Council, nor any officer of the Institute, was previously aware of the existence of the Bill. The clauses are here briefly abstracted, with notes:—

Clause 1 provides for the restriction of the use of the word “chemist.”

Clause 2 provides that on and after 1st January, 1925, “the Incorporated Society of the Institute of Chemistry” shall alone possess the power to authorise any person to assume or use the title “chemist,” and should conduct examinations for the purpose of granting persons such permission subject to certain control by the Privy Council. (This clause does not provide that a member of the Institute who has not been examined by the Institute can assume the title of “chemist.”)

Clause 3 introduces the “Incorporated Society of Pharmacy and Drug Store Proprietors of Great Britain, Limited” (styled in the Bill as “the Pharmacy Society”), and provides that the members of that Society shall be registered by the Registrar under the Pharmacy Acts, and that the said Registrar shall place upon the Register after the 1st day of January, 1925, other persons certified by duly qualified medical practitioners as of good repute and competent to carry on business as pharmaceutical proprietors.

Clause 4 gives power to the Pharmacy Society to conduct examinations subject to certain control by the Privy Council.

Clause 5 provides for the constitution of a Central Council, consisting of representatives of the British Medical Association, the “Incorporated Society of the Institute of Chemistry,” the Pharmaceutical Society, and the Pharmacy Society, with a Chairman, who shall be a member of the Privy Council. (The Central Council would appear to have the duty of keeping and controlling the pharmaceutical register, but it would serve no useful purpose for representatives of the Institute to be associated with it.)

Clause 6 consists of a contradictory and confused statement which is not intelligible, but is probably intended to give power to the proposed Central Council to conduct examinations.

Clause 7 provides that no person under twenty-one years of age shall carry on the business of pharmacy.

Clause 8 consists of provisions as to the sale of poisons.

Clause 9 refers to the sale of poisons by wholesale chemists, and provides that wholesale or manufacturing chemists shall employ at least one pharmaceutical chemist. (In this clause the word "chemist" is applied to persons in manufacturing or wholesale business, in contradiction to Clauses 1 and 2. The latter part of the clause could hardly be tolerated by the chemical industry.)

Clause 10 restricts the sale of articles mentioned in the British Pharmacopœia to persons on the Pharmaceutical Register subject to certain powers of local authorities to grant licenses to other persons where there is no registered pharmacist within a reasonable distance. (This would restrict the sale of many articles ordinarily sold by grocers.)

Clause 11 provides that the Pharmaceutical Register shall be controlled by the Central Council.

Clause 12 provides for the restriction of advertisements of medicinal articles referring to the curative powers of such articles with reference to more than three specific diseases or complaints, and the restriction of such advertisement without the previous sanction of the Central Council.

Clause 13 provides a penalty of £5 for offences.

Clause 14 defines "local authority."

Clause 15 provides that the act shall not apply to Ireland.

Clause 16 provides that it be cited as the Pharmacy Act, 1921, and may be construed as one with the Pharmacy Acts, 1851 to 1921.

On the advice of the Legal and Parliamentary Committee, a letter in the following terms was addressed to Capt. O'Grady, Col. Watts Morgan, and Mr. Thomas W. Casey, and copies

thereof were forwarded to each Member of Parliament and to the daily and technical press.

17th November, 1921.

SIR

PHARMACY ACTS AMENDMENT BILL.

The attention of the Council of the Institute of Chemistry of Great Britain and Ireland has been directed to "a Bill to regularise the position of all persons trading as chemists and druggists or pharmacy store proprietors in the sale of drugs, the dispensing of doctors' prescriptions, and the sale of medicine."

The official print states that the Bill was presented by Captain O'Grady, and supported by Colonel Watts Morgan and Mr. Casey.

In this Bill reference is made to "the Incorporated Society of the Institute of Chemistry" and to "the Institute of Chemistry."

The Institute of Chemistry of Great Britain and Ireland is the only body in this country incorporated by Royal Charter whose title contains the words "Institute of Chemistry," and the Council of the Institute desire me to inform you that they have not been consulted with regard to the provisions of this Bill and have not had any information regarding its promotion.

The Institute of Chemistry is established to examine and register persons found competent to practise chemistry in its applications to the arts and manufactures, as distinct from those who practise pharmacy and are engaged in the sale of drugs and medicines, and in the dispensing of prescriptions.

The Council of the Institute deplore the confusion which arises through the application of the term "chemist" to two distinct callings, and they would welcome any legislation which would tend to remove this confusion. They hold that the use of the distinctive titles of "chemist" and "pharmacist" to denote these callings would tend to the general recognition of the difference between them and to the removal of a confusion which exists in no other country.

The Council wish to dissociate themselves from the suggestion that they should be represented on the Central Council, which it is proposed in the Bill shall be concerned with the Pharmaceutical Register, and from taking any part in the examination and registration functions vested by Royal Charter and the Pharmacy Acts in the Pharmaceutical Society of Great Britain. The Council do not feel called upon at present to comment upon the other provisions of the Bill.

I remain, Sir,

Your obedient Servant,

(Signed) RICHARD B. PILCHER,

Registrar and Secretary.

Meldola Medal.—Arrangements have been concluded with the Society of Maccabaeans in London for the award of the Medal instituted to keep alive the memory of Prof.

Raphael Meldola. A proof of the Medal has been struck, and is here illustrated.

The scheme for the award is as follows:—

MELDOLA MEDAL.

- (1) That a Medal, to be known as the Meldola Medal, be presented by the Maccabaeans annually for the most meritorious chemical work of the year ending the 31st December preceding the award.
- (1a) That it is recognised that, without in any way restricting the award to any particular branch of chemical work, the Administrators shall have primary regard to work done in Analytical Chemistry.
- (2) That the award be administered by the Council of the Institute of Chemistry and a Member of the Maccabaeans appointed by their Committee, with liberty to withhold it if in their opinion no work of sufficient excellence has been brought to their notice.
- (3) That the recipient be a British subject and not more than 30 years of age at the time of the completion of the work.
- (4) That the presentation be made by the President of the Institute of Chemistry at the Annual General Meeting of the Institute, which is usually held on 1st March.
- (5) That power to vary these conditions be vested in the Committee of the Maccabaeans and the Council of the Institute acting jointly.

The award will be made upon the recommendation of the Board of Examiners of the Institute, and the Council hope that the first award will be made at the Annual General Meeting on 1st March, 1922. Chemists are at liberty, at any time prior to Friday, 20th January, 1922, to direct attention to published work of distinctive character, preferably in Analytical Chemistry, carried out during the year 1921. Communications on the subject should be headed "Meldola Medal," and should be addressed to the Registrar.

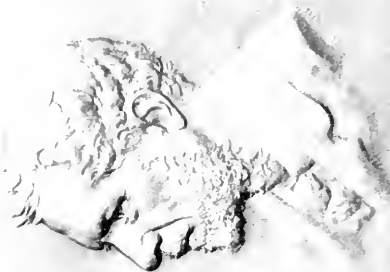
THE
MELDOLA MEDAL
PRESENTED BY

THE SOCIETY
OF CHEMISTS
TO

THE CITY OF
THE

MAGISTRATES
IN RECOGNITION OF THEIR
HONORARY PRESENT
TO THE SOCIETY

THE MELDOLA MEDAL
PRESENTED BY
THE SOCIETY OF CHEMISTS
TO THE CITY OF THE



MELDOLA

"MELDOLA MEDAL"

Gas Examiners.—In Part I. of the Journal for this year (pp. 40-41), reference was made to the question of the qualifications to be required of Gas Examiners under the Gas Regulation Act, 1920. In June the Gas Referees published, for the information of local authorities and Quarter Sessions, a memorandum on the appointment, qualifications and duties of Gas Examiners, from which the following paragraphs are quoted:—

“As regards ‘competence’ of Gas Examiners, the Gas Referees consider that it is important that a Gas Examiner should have a sufficient knowledge of physics and chemistry to enable him to understand thoroughly the tests to be applied to the gas. It is also important that he should be a person accustomed to making quantitative measurements, the accuracy of which he is prepared to sustain under cross-examination. A person of good professional standing as an analyst or engineer, and with experience of the physics and chemistry of gas, would be suitable. In any case the qualifications of the Gas Examiner should be such as to inspire the confidence of the public and of the management of gas undertakings.

“As regards ‘impartiality,’ it is obviously undesirable that the Gas Examiner should be in the employment of the gas undertaking, or should have any financial interest in it; and that when the Local Authority owns the undertaking he should not be an employee of the Authority.

“When a Gas Examiner is appointed, a deputy similarly qualified should, where practicable, also be appointed to act in his temporary absence.”

It appears to be held by some members that these appointments should be restricted to properly qualified chemists; but the Gas Referees are fully aware that other persons, including physicists and engineers, are able to do the work. The Council, therefore, have not pressed the opinion referred to, and would, in fact, suggest that the memorandum be left sufficiently wide in its terms to provide for the appointment of any person of good professional standing possessing the necessary experience of the physics and chemistry of gas.

Professional Charges.—The Public Appointments Committee learn that enquiries received from members on the subject of professional charges are becoming far more frequent than in the past. Such enquiries have been received not

only from private consultants, but also from chemists in works and in official establishments, who find the data which the Institute is able to supply useful in preparing statements to show the economic running of laboratories.

Apart from the results of analyses and investigations undertaken, the opinion and advice of a professional chemist constitute, in many cases, the main value to the client. Retaining fees and fees for consultation should, therefore, be subject to special arrangement, according to the professional standing of the consultant, the nature of the information required, the character of the work and the responsibility involved, e.g. to report on a process or invention for company promotion; to report on a public water supply or on medicinal waters; to advise or report in connection with matters of dispute likely to involve litigation and attendance at court.

The fees scheduled by the Committee, of which particulars can be obtained from the Registrar, give an indication of the usual charges for ordinary investigations on single samples.

Fees for the examination of substances not at present scheduled, must, owing to the varying complexity of the nature of such substances, be fixed by special arrangement, according to the requirements of the client. It is advisable, however, that chemists and their clients should mutually agree as to the fees to be charged before the work is undertaken.

War Office.—About a year ago, at the invitation of the War Office, the Council appointed Mr. Horatio Ballantyne (Vice-President) as representative of the Institute to serve on a Committee appointed to enquire into various matters relating to the work of the Directorate of Chemical Inspection, Royal Arsenal, Woolwich, including the status, grading, and remuneration of the chemists of the Directorate.

In answer to an enquiry recently addressed to the Secretary, War Office, the Registrar has been recently informed that the Army Council greatly appreciated the valuable services rendered by the representative of the Institute on the Committee, but expressed regret that it had not yet been found

possible to reach a final decision with regard to the Committee's recommendations, which are still under consideration.

India.—Attention has been directed to the treatment of certain scientific workers under the Indian Government in the matter of Overseas Allowance. This allowance was introduced a few years ago partly to compensate for the increase in the cost of living. The majority of the Regular Services were given allowances ranging from Rs. 150 to Rs. 250 a month, but several chemists attached to non-scientific departments have not received it. The Council of the Institute therefore are taking the matter up with the authorities, and in the meantime advise chemists who are candidates for appointments in India to stipulate for the allowance referred to.

India.—Following a Conference with Fellows of the Institute usually resident in India, but lately on leave, the Council have appointed a Special Advisory Committee to report to the Nominations, Examinations and Institutions Committee on applications for membership and examination received from chemists trained or resident in the Indian Empire.

Institutions.—University College, Swansea (University of Wales), has been added to the list of Institutions recognised by the Council for the training of candidates for the Examinations of the Institute.

The Council have decided to accept Associates of the College of Technology, Manchester, in the Department of Bleaching, Dyeing and Printing, as candidates for the Examination for the Associateship of the Institute, provided that they have completed the third year of the course for the Associateship of the College in General Chemical Technology, and have otherwise complied with the Regulations required of candidates who hold the latter diploma.

Examinations.—A number of Registered Students appear to be in doubt as to the nature of the Examination which they

will be required to pass for the Associateship. Candidates registered prior to 1st March, 1920, who have complied with the Regulations in force prior to that date, have the choice of taking the examination in a special branch as then prescribed or the Examination in General Chemistry now prescribed. All candidates who were not registered or whose applications were not received prior to that date are required to take the Examination in General Chemistry under the Regulations now in force.

Conjoint Board of Scientific Societies.—Mr. Horatio Ballantyne and Sir Herbert Jackson (Vice-Presidents) have been appointed representatives of the Institute on the Conjoint Board of Scientific Societies for the year 1922. The thanks of the Council have been accorded to Sir James Dobbie, who previously represented the Institute on the Board, but is now unable to do so owing to his having taken up permanent residence in Scotland.

Iron Portland Cement.—Prof. Cecil H. Desch has been appointed as representative of the Institute on the Sub-Committee of the British Engineering Standards Association for the preparation of a standard specification for cement made from blast furnace slag.

Appointments Register.—The circularisation of manufacturing firms, in order to direct their attention to the Appointments Register of the Institute, was not at first productive of many enquiries; but this was followed by a further issue of circulars, together with copies of the Register of the Institute, with better results. The number of vacancies for chemists notified by the Institute has lately shown a tendency to increase, and there appears good reason to hope that many of the members who have become disengaged, owing to recent industrial conditions, will secure appointments in the near future.

In this connection the Council and Officers of the Institute have had due regard to the interests of Fellows and Associates who are already acting as consultants to, or in the employ of,

the companies and firms to whom the circular is addressed. Many firms do not maintain chemists on their staffs, but send work to chemists in general practice. Such firms would not lightly entertain the establishment of laboratories at the present time. The majority, however, of the concerns selected for circularisation, are known to employ their own staffs of chemists, and it is hoped that they will employ greater numbers when industry generally has become more active.

Professional Interests.—Attention has been directed to another matter affecting private practice, viz., the tendency of some commercial and industrial concerns to exploit their chemists by undertaking "outside" routine analytical work in competition with private practitioners. The system is abused, moreover, when such concerns tout for practice. There can be no objection to industrial concerns undertaking tests which cannot be adequately performed by practitioners; there are obviously certain kinds of investigations and large scale experimental tests which can only be carried out in the works; but it would be against public policy to render independent practice impossible and it would be contrary to the principle that the individual chemist should be free to develop his sphere of work so long as he conforms to the accepted ethics of the profession. The Council hold that the qualifications for the practice of professional chemistry being purely personal, it is highly undesirable that a company or corporation should represent itself as "analytical and consulting chemists," and, further, that all papers and certificates relating to analyses should bear the names of the chemists responsible for the performance of the work.

Financial.—The Council have made a further application to the Chief Inspector of Taxes for the remission of Income Tax on dividends accruing to the Institute from its invested funds. The reply was to the effect that the claim could not be entertained because the objects of the Institute extended beyond those of the Friendly Societies and similar Institutions which are entitled to exemption from tax. The Council

submitted the view that although the interests of the profession and its members entered largely into the objects of the Institute, the Crown had granted the Institute a Royal Charter for the public benefit, and that the activities of the Institute were essentially directed to the public good. The Institute had rendered service to the country prior to and throughout the war, without expense to the Government and at great expense to itself. The public work of the Institute was set forth in considerable detail, and it was shown that the expense involved was derived solely from the voluntary contributions of the members who were themselves thus subject to tax individually and collectively. Seeing that the Charter enjoined the Institute to devote the whole of its funds to promoting its objects, and at the same time allowed Fellows to compound for their subscriptions, the Council claimed that the income derived from its investments should not be taxed until the amount of such income exceeded a sum representing the aggregate normal subscriptions of the Life Fellows then living.

The invested capital of the Institute consisted almost entirely of invested Life Compositions which could not be regarded as income. There were about 430 Life Fellows; the annual subscriptions which would have been derived from these Fellows if they had not paid life compositions would have been £903. The whole of this sum would have been devoted to the purposes of the Institute, in accordance with the provisions of the Charter, without payment of any tax. The total amount received in Life Compositions since the foundation was approximately £7000. If the Institute spent Life Compositions as it received them it would be most improvident, seeing that there were substantial expenses involved in the maintenance of the Institute, the publication of a journal, lectures, etc. The sums received for the bulk of the Life Compositions, moreover, were based on amounts determined prior to the war when the economic conditions were very different, and they were now actuarially unsound. The income derived from the investments of the Institute,

valued, 31st December, 1920, at £7500, was only £345 10s. *od.* (after deduction of income tax). It seemed an injustice that, because the Institute had to invest Life Compositions, it should lose so large a proportion of this income by tax being deducted. It was clear from the accounts that for a period of nearly thirty years there had been very little surplus of receipts over ordinary expenditure, and that the Institute had devoted the whole of its receipts, except Life Compositions, to the objects for which it was incorporated by Royal Charter. Although, owing to earlier investments, the total value was about £500 in excess of the Life Compositions received, it had not been possible, during the past few years, to carry on the work efficiently and to invest systematically all the Life Compositions received; and these investments were actually in arrear to the extent of about £150.

With regard to Schedule A. No. 6, the Council claimed that the property of the Institute in any case in respect of such of its examination laboratories as were not occupied by any person or by any individual paying rent for the same, but were used for the examinations of the Institute conducted under the provisions of the Charter, should come under the Rules in No. 6.

The further consideration of the matter is for the present postponed.

Entrance Fees.—The revised By-Laws, adopted by the Institute in General Meeting in 1920, provide that the amount of the Entrance Fees of Fellows and Associates shall, on the recommendation of the Council, be determined from time to time by a General Meeting. In order to comply formally with the new By-Laws, the Council will recommend at the next Annual General Meeting—to be held on 1st March, 1922—that the amounts of the Entrance Fee for new Fellows be (a) Five Guineas for those who have been examined for Fellowship, and (b) Ten Guineas for all Candidates other than Associates who are elected Fellows without examination; and that the Entrance Fee to be paid by all Associates elected with or without examination after 1st March, 1922, be Two Guineas.

Local Sections.

Belfast Section.—An inaugural luncheon was given by the Section on 22nd October at Thompson's Restaurant. The guests included Mr. J. G. Crawford (Chairman of the Linen Research Association) and Major Stanley (Principal of the Municipal College of Technology).

The loyal toast having been honoured, Mr. J. H. Totton (Chairman of the Section) referred to the progress and development of the Institute in recent years. Although the Belfast Section might be at present comparatively small in numbers, its influence with the Council would not be negligible on that account. He had had occasion to criticise the policy of the Institute, but the points he had raised had been very carefully considered by the Council. He felt sure that any matter brought forward by the Section would receive even more consideration. The Institute would be what the members made it; and the greatest advantage of the Section would lie in the opportunities it would provide for social intercourse. In proposing the toast of "The Guests," he referred to Mr. Crawford as a pioneer among business men in Belfast who believed in the application of science to industry.

Mr. Crawford, in reply, said that he was convinced of the utility of science in industry, and expressed his opinion that the chemist was becoming better understood by the business man.

The Committee will make arrangements for the members of the Section to lunch together informally at monthly intervals and to hold evening meetings for the discussion of problems encountered by members in the course of their professional work. A catalogue of periodicals taken by members is being compiled with a view to reciprocal lending facilities.

Bristol and South-Western Counties Section.—A dinner was held at St. Stephen's Restaurant, Bristol, on Wednesday, 9th November, Professor Wertheimer in the chair. Twenty-two members were present, several bringing friends with them.

The dinner was followed by a general meeting. A message of congratulation was sent to Dr. Cook, a member of the Section, on his election, that day, as Lord Mayor of Bristol.

A letter of good wishes for the success of the Section, received from the Registrar, was read by the Secretary, who also referred to many letters of regret from members who were unable to be present. Mr. Embrey and Mr. Littlefield were unanimously elected to fill two vacancies on the Committee. The recommendations of the Committee on the final wording of the rules of the Section were then read by the Chairman, and adopted unanimously. It was agreed that for the present, as it would be almost impossible to secure a sufficiently large attendance for a quorum in any place other than Bristol, meetings should be held there.

The business was followed by a successful smoking concert, to which Miss Matthews, Miss Osgood, Messrs. Hellier, Popham, Wintle, and Williams contributed.

At a Committee meeting on 23rd November, Professor Wertheimer was unanimously elected Chairman, and the Committee decided to nominate Mr. Littlefield as the District Member of Council.

Glasgow and West of Scotland Section.—A meeting of this Section was held on December 1st in the Technical College, Glasgow, Mr. Wm. Rintoul in the chair. About 40 members were present, and a discussion on "The General Policy of the Institute of Chemistry" was opened by the Chairman, and many of those present contributed their views. The main points considered were the Pharmacy Acts Amendment Bill, the question of taking joint action with other bodies with the object of initiating a publicity campaign, the method of election of members of Council, the admission to the

Institute of Fellows and Associates without examination, and the question of finance as affecting the Local Sections of the Institute. The Local Secretary was instructed to write to the Registrar expressing the opinions of the meeting, with a view to their being brought before the notice of the Council. It is intended that the discussion be continued at a later date, after a reply from the Council shall have been received.

Huddersfield Section—At the request of a meeting of Fellows and Associates held in the Technical College, Huddersfield, on 14th October, the Council have authorised and confirmed the formation of a Local Section of the Institute for Huddersfield and district. Hon. Secretary, Mr. D. H. Peacock, B.A., B.Sc., F.I.C., 5, Virginia Road, Marsh, Huddersfield.

The First Annual General Meeting of the Section was held at the Queen's Hotel on 25th November, Dr. H. H. Hodgson in the chair. The Assistant Secretary of the Institute attended.

The Committee were elected as follows:—Dr. H. H. Hodgson (Chairman), Mr. S. Robson (Treasurer), Mr. D. H. Peacock (Secretary), Dr. A. E. Everest, Mr. H. W. Moss, Dr. E. F. Pollock, and Mr. J. H. Wilson.

The Chairman then briefly outlined the policy which the Committee of the Section hoped to pursue. Within the Section they hoped to promote good fellowship and a keener sympathy based on common interests. With regard to their relationship as chemists to the State of which they were citizens, he called their attention to a recent address by Sir Richard Gregory, and emphasised a point there raised that in the past scientists had been too centralised, and the nation, although its prosperity had increased largely as a result of their research, had been unaware of their existence. The formation of the Local Section was an attempt to decentralise, without, however, becoming parochial in interest. It was hoped to hold meetings, addressed by specialists and well-known speakers, which would help the members of the

Section to keep alive their interests in the matters not directly affecting their special work, and would also educate public opinion in the district in matters chemical.

The Assistant Secretary of the Institute suggested that the Section should endeavour to give the widest publicity to its proceedings in the local press, and so help to mould public opinion. He stated that the Council hoped that the various Yorkshire Sections would co-operate as far as possible in the way of joint meetings. The Section could be of considerable use to the Council in advising it as to the qualifications of intending members, and in the work of the Institute generally.

It was announced that the February meeting of the Section would be confined to members only, and would take the form of a discussion on the relation between the Institute and technical education in this country.

On the completion of the business, an impromptu smoking concert was held, to which Messrs. W. Burrell, G. M. Green, W. E. Sanderson, and others contributed.

Irish (Dublin) Section.—The Annual General Meeting of the Section was held on 25th November at the Royal College of Science for Ireland. The Report of the Secretary and Hon. Treasurer was received and adopted, and the following were re-elected as the Committee for the ensuing session:—Dr. W. E. Adeney (Chairman), Prof. Sydney Young (Treasurer), Dr. A. G. Leonard (Secretary), Prof. Hugh Ryan, Dr. J. H. Millar, and Mr. B. G. Fagan. The vacancy caused by the death of Sir Charles Cameron will be filled at an early meeting of the Committee.

Liverpool and North-Western Counties' Section.—The Section held a dinner, jointly with the Local Section of the Society of Chemical Industry, on Saturday, December 3rd, at the Exchange Hotel, Dr. G. C. Clayton C.B.E., presiding.

The loyal toasts having been received with musical honours, the Chairman called upon the Registrar of the

Institute to propose "The City of Liverpool." The Registrar congratulated the City on the election of a Lord Mayor who by his presence at the dinner showed his interest in science and its applications. He referred to the circumstance that a Fellow of the Institute, Dr. Cook, had recently been elected Lord Mayor of Bristol. It was a great thing for Liverpool that its professional men were prepared to make sacrifices in order to take part in local government affairs.

The Lord Mayor, in reply, complimented chemists and the chemical industry on the progress made in the science of chemistry and its application, and suggested certain abstruse problems for investigation.

Vice-Chancellor Adami, of the University of Liverpool, proposed "The Institute of Chemistry and the Society of Chemical Industry," remarking that the chemical department of the University was the only department upon which they could afford to spend money for extension. The University had not only to teach the principles of chemistry, but the application of those principles to industry and the problems of everyday life. He expressed the hope that chemical industry would play a large part in the revival of the country's commerce.

The President of the Institute said that the Institute was the qualifying body and the guardian of the interests of professional chemistry. It set the hall-mark of competency on the professional chemist, thereby affording the public a guarantee that the person so stamped was one in whose integrity and professional ability they may repose confidence. He would like to indicate very briefly how enormously important chemistry was, and to take the opportunity of putting in a plea for its wider recognition and more adequate official support. The public did not understand sufficiently what we do; it is, to some extent, our own fault for not adequately instructing them. There was scarcely an industry of any importance which was not based on the results of chemical investigation, which was not dependent for its success upon continuous chemical supervision and control:—The Coal and

Coal Gas Industry, with all the enormously important subsidiary industries which are dependent on it; the Metal Industries, Oils and Fats, Pottery, Glass, Porcelain and Refractory Materials, Dyes, Mortars and Cements, Agriculture, the various Fermentation Industries, Rubber, Tanning, and many others too numerous to mention.

In most industries the chemist was the important person. Without him, many of them would never have existed; without him they could not be carried on successfully. Chemistry was, perhaps, the most potent of all factors in the creation of material wealth. He was sure that it was infinitely more important in our present condition of national exhaustion to devote our attention to the creation of new wealth than to squabble, as so many were doing, over the distribution of that which the war has left to us. To this end the encouragement of chemistry and the fullest utilisation of our chemists was a matter of the most urgent national importance. He quoted an abstract from a leading article in a recent issue of *The Times*, headed "The Technicians in Industry." The writer says:

"The backward state of technology in this country and the wonderful superiority of our industrial rivals were incessantly pressed upon British manufacturers before the war, but the importance attached to technical training was not extended to those who receive and apply it in practice. They have been taken for granted as part of the industrial apparatus. This was conspicuously shown during the war. Employers and labour leaders were constantly taken into council, and distinctions have been lavished on both, but the Technicians, who had far more to do with the actual business of producing munitions than either, were largely ignored. So, too, they are habitually overlooked in industrial inquiries, conferences, disputes, and conciliation machinery. In the discussion of industrial relations and economic problems the old categories of Capital and Labour, never adequate and now quite out of date, are still used. It is not perceived that a class has arisen which fits into neither, but is equally important, and indeed, less easily replaced than either."

In the fuller recognition of science and in the closer intimacy of science and industry are to be found the solution of many of our existing difficulties and perplexities.

With reference to the importance of chemistry in time of war, the President said that high explosives, propellants and all

the generally accepted munitions of modern war owed their existence to the chemist and were necessarily manufactured under his supervision and control.

He did not propose to enter into the vexed questions as to whether the use of poison gas was justifiable, or whether the activities of our universities should be devoted in any way to specific research in that direction. Everyone devoutly prayed that there might never be such another war, but he was afraid there were very few who do not share the fear that there might be. He recalled the old admonition of Cromwell: "Trust in God, but keep your powder dry." He would like to paraphrase that, and say, "Trust in the League of Nations, but keep your chemists active!"—for conventions or no conventions, the next war would be largely a chemical war. A nation fighting for its existence would use every means to hand, and the country which had the most powerful weapons and which could introduce effectively the element of surprise, would be at a very great advantage as compared with its adversaries. That even the politicians realise this possibility and fear it, was shown by the recent remarkable speech of Mr. Asquith, in which he made the extraordinary suggestion that chemists working in various countries should be compelled to publish all their discoveries at stated intervals.

Unless this country is well to the fore-front in all those industries which had a bearing direct or indirect upon the manufacture of war materials, and in research dealing with the application of chemical substances to warfare, its position, should there unhappily be another great conflagration, would be very serious indeed. Our national existence, in fact, might depend upon the way in which chemistry was recognised and supported during the years immediately ahead. At a recent meeting a very eminent engineer said: "But for our chemists and our engineers the British Empire would have ceased to exist." This was not an exaggerated statement made for the purpose of effect, nor was it the unconscious exaggeration of a man obsessed with the importance of the profession of which he was a member. It was the literal

and unvarnished truth. He quoted a recent saying of Marshal Foch on chemistry: "There is no science that is so nearly bound up with the future of our industrial and military forces. France will not remain indifferent to this branch of science that she has neglected for so long."

As in France, so in England, the importance of chemistry was thoroughly recognised during the war, but there were signs that the public were already forgetting, and if we were not careful we might find ourselves again in that condition of unpreparedness in which we found ourselves in 1914.

The Institute and the various Chemical Societies were doing a very great deal in their corporate capacity, but it was the duty of every chemist to act as a centre of propaganda and to do everything he could to make the general public, and through them the Government, understand that, among all the branches of human knowledge and activity, chemistry stood pre-eminent as that on which our national progress and our national security depended. In that way alone would chemistry receive the recognition and support which was its due, and which it ought long ago to have been accorded.

Mr. Max Muspratt, Vice-President of the Society of Chemical Industry, said that chemistry was going to keep Great Britain in its commerce and industry up to the high level of which she was capable, and at which they intended she should remain. He held that chemists should hold a dominant position in the affairs of the country, because they had the attributes to guide the country on the best lines, and to keep the nation and the Empire at the head of the nations and empires of the world.

Dr. E. F. Armstrong also responded for the Local Section of the Society.

Mr. Alfred Smetham proposed the toast of "The Guests," to which Mr. Alderman Muirhead and Mr. G. Hammond Etherton (Town Clerk) responded. Mr. W. A. Short having proposed the toast of "The Local Sections," the Chairman and Mr. H. J. Evans responded.

A programme of music was provided by Mrs. Baly, Mrs. Hanley, Messrs, F. W. Hughes, A. Kennedy, J. Hanley, and R. Lloyd Moore.

London and South-Eastern Counties Section.—On 19th October, Mr. Lewis Eynon, at the invitation of the Committee of the Section, related his experiences with the Special Brigade, R.E. (Gas Services). Many members who served with the Brigade contributed to the discussion which followed, and frequent mention was made of Col. Harrison and the anti-gas services.

On 28th November, the Section held a dinner in aid of the Benevolent Fund. The President and the Hon. Treasurer of the Institute spoke on behalf of the Fund, and a total of £105 11s. was received either at or after the dinner. This sum has been handed over to the Hon. Treasurer. In addition to donations, many members have promised annual subscriptions, and several have also promised to assist in stimulating interest in the Fund among their chemical colleagues in various works and institutions. The general feeling was expressed that if every member of the Institute gave a small sum, such as 5s., when paying his annual subscription, the Fund would soon be put on a satisfactory basis.

Mr. P. H. Kirkaldy, having served three years on the Committee, has vacated the chair, and has accepted the post of Hon. Treasurer. The Section owes a deep debt of gratitude to Mr. Kirkaldy for his services. Mr. E. R. Bolton has been elected Chairman for the ensuing year.

The number of members has increased, but it is still felt that the usefulness of the Section would be much greater if all members of the Institute resident in the area would join.

Any member who has not yet paid his subscription (5s.) is reminded that it became due on 1st November.

Manchester Section.—The Annual General Meeting was held in the College of Technology on 2nd November, about 40 members being present.

Dr. A. Coulthard, Mr. D. M. Paul, Mrs. L. Pearson, and Mr. R. S. Wishart were elected members of Committee.

Mr. Wm. Marshall, the Chairman, in the course of his address, spoke of the co-operation of the Institute with the Board of Education on the question of the training of students of chemistry.

He referred to the serious effect of the present condition of industry on the prospects of the profession, mentioning that something like 100 members were actually disengaged at the moment. A strong appeal was therefore made to the members to give all possible support to the Institute Benevolent Fund. He urged upon all Associates the desirability of proceeding to the Fellowship.

It was decided to hold a special meeting for Students at the end of the session.

Arrangements have been made in conjunction with the Manchester Section of the British Association of Chemists for a series of lectures on Patent Law, to be delivered by Mr. H. Potts on 5th, 12th, and 19th December.

The following resolution was passed: "That in the opinion of the Manchester Section, the time has arrived when an annual *per capita* grant of not less than two shillings and sixpence should be made to the local sections in order to meet the expenses and assist the development of the sections."

A joint meeting with the Manchester Sections of the Society of Chemical Industry, The Society of Dyers and Colourists, and the Manchester Literary and Philosophical Society (Chemical Section) will be held on 7th January in the Textile Institute, when Dr. A. Harden will lecture on "Bio-Chemical Method."

Newcastle-upon-Tyne and North East Coast Section.—The second Annual Meeting of the Section was held on Tuesday, the 6th December, in the Rooms of the Chemical Industry Club, Newcastle-upon-Tyne, Mr. C. J. H. Stock in the chair.

The ballot for the election of the Committee for the ensuing year resulted in the following members being chosen:—Dr. A. Fleck, Dr. Dunn, Mr. Wallace, Dr. Weyman, Dr.

Bowles, Prof. Louis and Dr. Davidson. Dr. Fleck was re-elected to the position of Treasurer. Dr. Paterson explained that for business reasons it would not be possible for him to carry on the secretaryship, and Mr. C. J. H. Stock was elected in his place.

A letter was read from Prof. Haworth asking for the co-operation of the Section in the formation of a Permanent Fund for the provision of a series of Annual Lectures in Applied Chemistry, to be open to University Students, members of the Society of Chemical Industry and of the Institute.

On the understanding that Mr. Stock had agreed to stand for election as a general member of Council, it was necessary to nominate another member as District Candidate. The Meeting agreed to nominate Mr. W. Mc.D. Mackey, of Leeds.

Sheffield.—A well-attended meeting of members of the Institute resident in the Sheffield district was held at the King's Head Hotel on 3rd December, Prof. W. P. Wynne in the chair. After discussion on the desirability or otherwise of forming a Sheffield District Local Section of the Institute, the following resolution, proposed by Mr. W. J. Rees, and seconded by Mr. John Evans, was carried unanimously:—

“That this meeting of Sheffield and District members of the Institute requests the Leeds District Local Section to form with Sheffield and such other Yorkshire towns as are willing to associate themselves together for this purpose, a Yorkshire Section of the Institute of Chemistry.”

Mr. W. J. Rees, who acted as Hon. Secretary for the purposes of the meeting, was asked to convey the resolution to the Registrar of the Institute, in order that it might be communicated to the Yorkshire members and to the North-East Coast, and Yorkshire (Leeds Area) Local Sections.

South Wales Section.—The Annual General Meeting was held on 19th November, and was followed by a dinner and smoking concert, which were much enjoyed. Mr. F. J. Bloomer was re-elected Chairman, and Mr. L. E. Hinkel, Hon. Secretary, for the ensuing year.

Yorkshire (Leeds Area) Section.—A meeting of Fellows and Associates was held at the Queen's Hotel, Leeds, on Thursday evening, the 24th November, to consider the advisability of forming a local section in the Leeds District. Prof. Smithells, C.M.G., was elected to the chair. About thirty members were present, including Mr. Marlow, the Assistant Secretary of the Institute. Letters in support of this project and expressing regret for non-attendance were received from about forty members.

Professor Smithells, in opening the meeting, referred to the Conference of members held in September at York, at which a resolution was passed to the effect that a local section of the Institute should be formed at Leeds. He asked Dr. R. B. Forster, who had convened the present gathering, to speak on the York meeting and to explain its objects.

Dr. Forster said that the whole of the North-East Voting District had been hitherto represented by only one local section—the Newcastle Section; but it was not possible for members resident in Yorkshire to attend meetings in Newcastle. The Yorkshire members were therefore without the advantages of a local section. The feeling expressed at the meeting at York was that a local section should be local in reality as well as in name. Several of the Newcastle members, from experience in working their own section, supported this view. The meeting therefore recommended that it would be advisable to form local sections at Sheffield, Huddersfield, and in Leeds (District). He had been requested by that meeting to call together the members in the vicinity of Leeds to ascertain their views on the matter.

Since the meeting at York he had received communications from representatives of Hull and York stating that as they were not strong enough to have sections of their own, they would like to be attached to the Leeds District Section. He saw no reason why localities with a small membership should not attach themselves to the most convenient local section. There was reason to believe that Middlesboro' desired to be attached to the Newcastle Section. He felt strongly that

for a local section to be of real value it should be convenient to the homes of the majority of its members, so that they could easily get together to discuss matters of professional interest and thereby take an active part in the progress of the Institute and the advancement of their profession. He mentioned that a local section had already been formed at Huddersfield, and that Sheffield members were about to hold a meeting to consider the question.

Dr. Forster said that he was glad that they had the Assistant Secretary, Mr. Marlow, with them that evening, and suggested that he be asked to explain the objects and advantages of local sections.

Mr. Marlow, in reply, conveyed to the meeting the greetings of the President and Council, and their hopes that if a local section should be formed it would exercise a lively influence on the policy of the Institute. He also expressed the Registrar's regret that a prior engagement rendered it impossible for him to be present.

He drew attention to the objects of local sections as set out in detail in the Draft Rules which were published in Part III. of the Journal for 1918. He suggested that the advantages of the formation of local sections might be considered from several points of view. In the first place, the members of the Section by social intercourse would engender a sense of fellowship which was an essential part of any strong professional organisation, and those who attended section meetings would have an additional inducement to read the Journal: his experience taught him that far too many members failed to notice what was reported of the Institute's activities. Then, the Council had already had good reason to appreciate the help of Local Sections which had forwarded valuable suggestions for consideration. The Sections, through their local Interviewing Committees, had rendered invaluable assistance in dealing with applications for membership. Lastly, he felt that sections were able to exert a powerful influence on local public opinion in many ways, e.g. through reporting their proceedings in the press. Section committees

had assisted materially in the working of the Appointments Register by providing the Registrar with lists of firms who should be approached with regard to the facilities offered by the Register.

The Council would provide funds for four meetings annually for official purposes. He wished to make it clear, however, that this money could only be expended in accordance with the provisions of the Charter, so that if the members wished—and he hoped they would—to arrange smoking concerts or other purely social functions, the expenses so incurred should be met by a small local subscription, or a charge for admission, unless such functions were purely auxiliary to the official business and did not involve extra expenditure.

After some consideration Mr. Mackey moved, Mr. Richardson seconded, and it was unanimously agreed to form a Leeds Area Section to include the districts of Bradford, Hull, Leeds, York, and Wakefield.

During the discussion Mr. Branson and Mr. Bliss referred to the desirability of holding a certain number of joint meetings with other societies. Dr. Abell welcomed the formation of the Section, as he felt that the Institute had been centred in the past too much in London, while provincial members had had little interest in their membership except as a qualification. He felt that Sections should influence the working of the Institute by electing local members on the Council. He also suggested that meetings should be held alternatively in the larger towns of the area.

The Chairman urged that it was desirable that the various local scientific societies, or sections of societies, should consult with a view to a convenient arrangement of meetings or joint meetings. He reminded the meeting, however, that the objects of the Institute differed from those of the other societies in that they were devoted to raising the standard of professional attainments and upholding the claims of those who were properly called chemists. He felt that local sections would exercise a helpful function by drawing members together as much for social intercourse as for purely professional

purposes. He felt that as a headquarters for scientific life in the West Riding a well-endowed social club was badly needed.

Mr. Marlow, in reply to a question by Mr. Mackey, said that the formation of a local section did not imply that an additional District Member of the Council would be created. It was possible for more than one section to exist in a District. The definition of the District for voting purposes was a matter for the decision of a General Meeting. He felt, moreover, that it was debatable whether it might not after all be better to re-define the District Areas rather than enlarge a Council which already could consist of as many as forty-six members.

A provisional committee was formed to organise the section and draft the rules. Those appointed were:—Prof. Arthur Smithells, C.M.G., F.R.S., Messrs. F. W. Richardson, B. A. Burrell, G. N. Grinling, J. A. Foster, W. McD. Mackey, Dr. R. D. Abell, Messrs. R. J. Ewart, and A. H. Clucas, with Dr. R. B. Forster (Provisional Secretary).

The meeting closed with votes of thanks to the Chairman, Dr. Forster, and Mr. Marlow.

Personal.

The President will represent the Institute on the General Committee of the British Empire Exhibition (1923).

Sir George Beilby, Past President of the Institute, has been appointed a member of the Advisory Committee for Coal and the Coal Industry. The Committee has been appointed by the Secretary for Mines in accordance with the provisions of Section 4 of the Mining Industry Act, 1920.

The congratulations and good wishes of the Council of the Institute have been accorded to Dr. E. H. Cook on his election as Lord Mayor of Bristol. Dr. Cook is also Chairman of the Bristol Education Committee.

Sir William Pope has received the degree of LL.D. *Honoris Causa* from the McGill University, Montreal.

The late Lieut.-Col. E. F. Harrison, C.M.G., F.I.C.—
A memorial plaque to the late Lieut.-Col. Edward Frank Harrison was unveiled on 2nd November, in the Examination Hall of the Pharmaceutical Society, by the Rt. Hon. Sir Laming Worthington-Evans, Bart., Secretary of State for War. Col. Harrison died on 4th November, 1918, from pneumonia, aggravated by exposure to gas during his experimental work.

The Secretary for War said that it was perhaps fitting that the constitutional representative of the British Army should be called on to pay a tribute of respect to the memory of one to whom the Army owed so much. The work and devotion of Col. Harrison had perhaps a more direct and visible effect in safeguarding his comrades in battle than the work of any other man. On behalf of every officer and man of the Army, he paid a tribute of respect and gratitude to the devotion and self-sacrifice of one to whom so many

owed their lives. He would not presume to do more than refer to the scientific attainments, the resolute courage and self-sacrifice of Col. Harrison. The problem that Col. Harrison was called on to solve was perhaps one of the most dramatic in warfare; he had to provide in the middle of a war, almost in the middle of a battle, an armour that would be proof against a new and sinister weapon, deadly to a degree hitherto unimagined in warfare. It was said to the honour of ancient kings that they slew their thousands and their tens of thousands: it would be Col. Harrison's memorial that he saved them; for not a man was sent to the front in the later years of the war who might not have to depend for his life at some unexpected moment on the skill and knowledge of the man whom they commemorated that day.

Notes.

Use of Private Premises for Professional Work.—

A consulting chemist, occupying a private house on a short lease and conducting part of his practice in a laboratory in the house, has been obliged to comply with an order of ejectment, owing to his landlord, who desired to sell the house, objecting to the conduct of a business on the premises. The matter is of general interest to professional men, many of whom—practitioners in medicine, law, dentistry, architecture, surveying, accountancy, journalism,—in varying degree, carry on their work at home. In the case in point, no objection had arisen with regard to the nature of the work, no inconvenience had been caused to neighbours, and no complaints had been made. The chemist was not disposed to appeal to the High Court, but obtained an extension of time (two months) to find other accommodation. The question which the High Court would have had to decide was whether

the practice of chemistry is carrying on a business. In cases where chemists are already so practising they in all probability assume that the right of a professional man to practice at home is duly acknowledged, and it would probably be indiscreet to raise the matter with their landlords. The question is worthy of note, however, as a warning to members who intend to conduct practice in similar circumstances to insure that their agreements do not debar them from doing so. Fellows and Associates who are aware of any case bearing on the question are invited to communicate with the Legal and Parliamentary Committee of the Institute.

Royal College of Science Chemical Society.—On 24th November the Registrar of the Institute gave an address on "The Profession of Chemistry" before the Royal College of Science Chemical Society in the Lecture Theatre of the Imperial College of Science and Technology, Prof. J. C. Philip presiding. An abstract of the address is published in this Part (See p. 358) for the information of Registered Students.

Books and their Contents.—The publication of the usual schedule of recent "Books and their Contents" is withheld until the next issue owing to considerations of space. The Publications Committee have received and will consider a suggestion that a brief review should be added to each book noticed.

Obituary.

HARRY INGLE died at Leeds on 4th December at the age of fifty-two years. He received his general education at the Leeds Middle Class School, and his chemical and scientific training at the Yorkshire College. In his last year of his course he collaborated with Prof. Smithells in the investigation of the structure of the Bunsen flame. He passed the examination for the Associateship of the Institute, obtained first-class honours in the School of Chemistry, and the Le Blanc medal in Technical Chemistry. He was the first chemical student of the Yorkshire College to graduate in the federated Victoria University, and the first graduate on whom the degree of Doctor of Science was conferred by the University of Leeds. He was also the first candidate recommended from Leeds under the scheme for 1851 Exhibition Scholarships for post graduate research, and he went abroad to study organic chemistry in Munich, where he was associated with both von Bayer and Thiele, his scholarship being renewed for a third year. Having obtained the degree of Ph.D., he was for a short time an honorary demonstrator in Organic Chemistry in the University of Leeds, continuing his research work, and then became Head of the Chemical Department in the Technical School, Hull, and subsequently chemist to the firm of Messrs. Barry Ostlere & Co., Linoleum Manufacturers, Kirkealdy. He investigated the changes which take place in linseed oil during the processes of boiling and after-use, publishing papers on this and allied subjects. It was an oil chemist that Dr. Ingle's name was best known, and it was mainly as a consultant on the chemistry of oils and fats that he was engaged during the later years of his life, when, after leaving Scotland, he conducted a consulting practice in Leeds. Jointly with Mr. J. A. L. Sutcliffe, he was the author of a book entitled *Oils, Resins and Paints*, and at the time of his death was an examiner to the City and Guilds of London Institute on the subject of oils and fats. He was elected a Fellow of the Institute in 1894.

FRANCIS WILLIAM PASSMORE died suddenly, from heart failure, at Bexley Heath, on 29th October, in his fifty-fifth year. From 1882 to 1887 he was pupil and assistant to Dr. Benjamin H. Paul, who at that time conducted a consulting practice in Fenchurch Avenue, London. He was then for a year private assistant to Prof. W. R. Dunstan, before proceeding to the University of Würzburg, where he assisted Prof. Emil. Fischer in research on carbohydrates. Having obtained the degree of Ph.D. in 1890, he became Assistant Demonstrator in the School of the Pharmaceutical Society, and in the following year, in partnership with Mr. H. Helbing, established an analytical and

consulting practice in Queen Victoria Street. He initiated the manufacture of saccharin on the large scale in this country, successfully devised a number of other industrial processes of importance, and had extensive forensic experience in connection with chemical patents relating to various industries. He was elected a Fellow of the Institute in 1918.

JOHN SPILLER died at Canonbury on 8th November, aged 88. He was a student at the Royal College of Chemistry from 1848 to 1850, where he continued as Assistant until 1853, subsequently occupying a similar position in the Metallurgical Laboratory of the Royal School of Mines until 1856, when he was appointed an Assistant Chemist to the War Department, which position he held until 1868. He was also Lecturer in Metallurgy at the Royal School of Gunnery, Shoeburyness, from 1864 until 1868, when he became Consulting Chemist to the Atlas Dye Works, which position he held until 1888. From 1856 to 1873 he was Examiner in Chemistry to the City of London School, and was the author of many papers contributed to scientific and technical journals. He was a Past President of the Royal Photographic Society, a Past Vice-President of the Society of Chemical Industry, a member of the General Committee of the British Association, and a member of the Essex County Technical Committee. He was a pioneer in the Volunteer movement, and became a Captain in the 26th Kent R.V. He was elected a Fellow of the Institute in 1878, and served on the Council from 1880 to 1883. At the funeral service at Highbury on 12th November, the Institute was represented by the Registrar.

“The Profession of Chemistry.”

Abstract of an address given by the Registrar of the Institute before the Royal College of Science Chemical Society on 24th November. 1921.

I have undertaken to speak about your chosen profession, and if at times I say things in the nature of homely truths, I hope you will be tolerant to one who stands in relation to the profession as an old retainer, although, on the other hand, you would also expect from an official some measure of restraint.

I propose to say a few words on “general education,” then to deal with the word “chemist,” touch briefly on the training of a chemist, his examinations and qualifications, possible careers and prospects therein, professional interests, and procedure in practice.

You are well aware that every man who wishes to be regarded as a professional man must have attained a good standard of general education if he hopes to maintain his position as such in the work-a-day world. I want to remind you, therefore, that whatever success you may achieve in life will be quite as much due to your cultivation of practical good sense and the general development of your mental faculties, will and judgment, as to your technical, that is, special, professional knowledge and skill. I want to offer, therefore, one suggestion, namely, that you should devote part of your time for recreation to literature; and I recommend especially the reading of biography and essays, as tending to induce the habit of methodical thought and expression in writing and speaking, which will carry you far in overcoming difficulties when you take your place in the counsels of men. A good book is a good friend, and of

books of the right kind you can hardly have too many. Books and friends should be selected with the same care. I would suggest, too, that, even in your choice of ordinary newspapers and journals, you should bear in mind that it is profitable to restrict your reading to those which will in no way detract from your acquiring a correct style.

British men of science have been criticised rather severely at times for slipshod writing and lack of lucidity. Such criticism was not altogether unjustified; but I think that the chemists of the future, by taking thought, could render their science more acceptable to the uninitiated by presenting it so that it could be more easily understood. A man of science should, on all occasions, be definite and accurate. As one of the uninitiated, I would ask you to be patient with us, remembering that it is fortunate, after all, that everybody has not the same leanings and the same kind and measure of understanding.

Dr. Johnson defined a *chymist* as "a professor of chymistry." Modern dictionaries define him as one skilled or versed in the science of chemistry. I hope when you have become duly qualified you will call yourselves *chemists*, and thus assist in establishing your right to a title which has unfortunately become attached by custom and, to some extent, by law, to another calling.

Pharmacists have acquired the use of the title "chemist," but, in my opinion, not the sole right to it. When the Pharmacy Act of 1868 was passed, the legislature, recognising the existence of other chemists, were careful to include in the Act a Section which clearly defined those to whom that Act applied, viz. "all persons who at any time before the passing of this Act have carried on in Great Britain the business of a chemist and druggist, in keeping open shop for the compounding of the prescriptions of duly qualified medical practitioners, also of all Assistants and Associates who before the passing of this Act shall have been duly registered under or according to the provisions of the Pharmacy Act and also to all such persons as may be duly

registered under this Act." There is no such definition in other restrictive Statutes relating to medical men, nurses, plumbers, etc.

Clearly, then, the Pharmacy Act—not the *Chemistry* Act—applies only to such persons as are cited, and does not apply to those chemists who pursue the science of chemistry, but do not keep open shop for the purposes mentioned. The main object of the Act was to ensure the qualification of persons keeping such shops, and to restrict the business of the sale of poisons to persons so qualified.

The proper title of such persons was "apothecary," and if you search our literature from the time of Chaucer you will find ample support for this view. Moreover, foreign countries use a word corresponding to *chemist* when they wish to refer to one, and words corresponding to *apothecary* and *pharmacist* when they wish to refer to apothecaries and pharmacists.

I have referred to this point because it is only right that chemists should retain their own name. I do not say that no pharmacist deserves the name; there are many who do; but I hold the view that it belongs essentially to those who pursue and practise the science and profession of chemistry.

The professional training of a chemist, when pursued on the right lines, demands mental ability of a standard at least as high as that required for any other professional career. Of your technical training, however, I propose to say little, because that is in good hands, and I know the high reputation of your College. I am acquainted with very many old students of the College, and I believe that they meet with a measure of success in life at least comparable with that of any other body of past students. I would merely say that this time of preparation is all important, and is a time for hard and earnest work.

Most of us have to make our way in the world as best we can by our own industry. Life is becoming increasingly difficult and strenuous for men of moderate capacity, and it is the more necessary, therefore, for every educated person

to strive to rise above mediocrity. There is a tendency in all professions towards overcrowding; but there is always room for the best in every profession. Some may have means or influence. The most valuable influence is the testimony of those with whom you have actually worked, and of those who can speak of your work from first-hand knowledge; yet, remember, that influence is of little avail without true worth: it may help you for a time, but in the end you must make your own way.

To return to training: although chemistry is your main subject, other science is very necessary to enable you to understand chemistry. The chemist must be an all-round man, well-informed generally. There is a limit to the period of your training, but you cannot know too much of anything useful, and you can never tell how soon you may have to draw upon any department of your store of knowledge. Therefore, you will be well-advised to take an interest in all science, and to endeavour at least to keep abreast of modern progress which has any relation to your own branch. In the language of Bacon, you must be a full man (i.e. well informed), and a ready man (i.e. ready to apply your information).

A well-trained chemist is equipped for many emergencies, and he is often expected to know about things and to do things which are really quite foreign to his ordinary curriculum. During your student days, and after, never lose an opportunity of seeing any sort of industrial operation on the large scale. It is well that you should realise how operations are carried on in filter presses instead of funnels, in large evaporating pans instead of basins, in tanks instead of beakers. Endeavour to become accustomed to think on the large scale, and to realise the possible bearing of laboratory work on large scale operations.

Another point—although you will almost inevitably become engaged eventually in a special branch of chemical work, you will be a better chemist if you first make sure of general principles. Therefore, you will be wise not to be in a hurry to specialise. Get all the general knowledge you

can while you are young. A good boxer must train the whole body; he must know how to use his fists, but he must also learn to use his head, his brain, and his feet, and to bring the force of all his body and all his skill to the business. Your training, however thorough, will not fit you to deal at once with every problem. It is only the foundation for experience, and you will profit little by experience unless you acquire an intelligent and informed judgment, and continue a student throughout your life.

A few words on examinations: examinations are not imposed to annoy you, but to test your fitness to attempt more difficult work. An examination should test your ability to deal with questions on the spur of the moment; to draw on the store of the mind and deliver the goods without hesitation. If you have not stored your mind with the facts and cultivated the method of wrapping them up properly you are not ready for the examination. In a subject like chemistry however, the tests applied are not based solely on memory. They call for reasoning and common sense, and often uncommon sense; so that, in my estimation, a chemist must have faculties of a higher order than those required by many other professional men. In any case, the examinations of everyday life will be far stiffer than those which you will have to pass before you can reckon yourself qualified.

Nearly thirty years' close association with examiners has taught me that, in general, they are very human, kindly people, keenly interested in their candidates, and only anxious to treat them fairly. They are judges of character, too, and look for the straightforward answer and the straightforward method of working, for evidence of real knowledge rather than shrewd guess-work.

In examinations, therefore, let simplicity take precedence of cunning, for the examiner is not easily deceived. To be accurate is, above all, necessary in matters of science, and any attempt at "hedging," or "beating about the bush," must be regarded with suspicion,—as a mask of ignorance or something worse.

When the training and examinations are done, and the A.R.C.S., B.Sc., or A.I.C., or all three, are added to your names—what then? Those who have an inclination to research should turn to it, if possible. All will not be so inclined, and all may not be offered the opportunity; but those who are fortunate enough to have the opportunity of working with a good research worker should make the best use of that opportunity, taking care to study the methods of attack adopted by workers of experience. When you have a clear idea of the problem to be solved, you should be able to discuss it, and therefore you should learn as much as possible of the ground which has been covered by others before you—for this is a journey on which you must carry as much knowledge as possible with you.

Post-graduate work often affords a chemist the chance to make something of a name for originality; he is fortunate if he has the good luck to open up new ground and to extend, if only a little bit, the already vast domain of his science, in which, paradoxical as it may seem, the more you discover, the more there seems to be explored.

Moreover, I think that the majority of those who are in a position and have the inclination to work for the higher degrees of M.Sc., Ph.D., and D.Sc., will likely enough in the long run pass their fellow students, although the latter may get the best of the start.

At this stage, however, the tendency to specialise should not be allowed to interfere with the main idea of developing the chemist, in the widest sense. He will be a better research worker if he keep himself, so far as is possible, well informed in the progress made in other departments of work.

The chief branches of employment are (1) Private Practice, (2) Industry, (3) Governmental or Municipal, (4) Educational, (5) a combination of two or more of the above, and (6) other employment—possibly commercial, administrative, journalistic—in which chemical knowledge is decidedly useful, although perhaps not essential.

In private practice the vacancies are not so numerous

as in industry. They occur in the laboratories of consultants, public analysts, chemical engineers, metallurgists, and other specialists. Experience gained with well-known practitioners is often of great value, not infrequently providing those who are able to take advantage of it with stepping-stones to positions of importance in industries relative to the practice. Thus, the public analyst's assistant becomes a chemist in a food or drug factory; the assistant of a metallurgist proceeds to metal works, and so forth.

The appointments in industry are necessarily various. In a large concern the start may be made in testing work,—the examination of raw material, intermediate and finished products, besides fuel, water, paints, lubricants, and other substances and materials required in the ordinary maintenance of the works. Chemists are also required for research, for plant control and management. In research, many concerns are now fully alive to the importance of work on fundamental principles. These concerns not only contribute to organised research associations, but make allowance for a certain amount of what might be termed *academic work* in their own laboratories. The main lines of research in works, however, are directed to improvement of quality; increase of yield; reduction of cost; utilisation of waste; and introduction of new products.

Plant control requires chemists who have the ability to direct processes, with the attendant difficulty of keeping on good terms with those who take part in the large scale operations. They must be ready to take off their coats, and be ready for emergencies, having due regard to the dangers (if any) of the work, besides being thoroughly acquainted with the plant and the principles of the process. Ever alive to the fact that business is business, and as such is run for the benefit of the employees as well as for the employers, they should not neglect opportunities of making useful suggestions for economical development which may be adopted forthwith, or referred to the research department for investigation.

The management of many industrial concerns is surely, though in some cases slowly, passing to trained chemists; that movement must tend to increase the demand for scientific assistance of the highest order, and such assistance is selected with greater discrimination than it was in the past.

In smaller concerns the chemists may be fewer, but the responsibility may still be considerable. In many cases, only one chemist is employed, and he frequently may hold appointment as manager, or assistant manager,—positions requiring an aptitude for business in addition to scientific attainments.

Coming now to Governmental and Municipal work—there are appointments for chemists in the Government Laboratory, and in laboratories under the War Office, Admiralty, and other Departments of State, besides municipal laboratories, public health laboratories; and the like. Some of these now—in contrast to pre-war days—afford a moderately good prospect, and in any case provide “jumping-off ground” to better positions.

In teaching, the appointments are numerous and the pay has lately been improved, though the appointments carrying salaries over £600 a year are comparatively very few. A real enthusiasm for the work is essential and the teacher, at any rate in Universities and technical colleges, should have ability at least equal in standard to that required of chemists in private practice and in industries. A chemist who wishes to teach and yet to be regarded as a chemist should not remain content to teach elementary science, and should strive, at all costs, to do some good research work, or he will soon cease to merit his qualification.

Among the miscellaneous careers for chemists, I may mention that not a few have qualified for the bar, and several are successful as patent agents.

When you come to earn your living, you will probably need to modify considerably your idea of the value of time, and you will need to give careful attention to the value of apparatus and material, and costs generally. The amount

of work expected of you in a day will greatly exceed what you have ordinarily done in the College. You will become part of a business concern, and, as such, must be in some measure profitable, or you cannot earn your salary. The change from college life to business must be faced. Employers are looking for live men who will show some enthusiasm for the interests of their concerns. The contract should not be a one-sided affair, but should be for the benefit of both parties.

"There is an implied contract, much stronger than any instrument of articles of agreement, between the labourer in any employment, and his employer, that the labour, so far as the labour is concerned, shall be sufficient to pay the employer a profit on his capital—a compensation for his risk; in a word that the labour shall produce an advantage equal to the payment."—*Burke*.

At this stage you will begin your business education: hitherto you have but prepared the soil, but if it is well prepared the seed will take root and grow. At first you will probably lack confidence in your own ability. Some time must necessarily elapse before you are acclimatised to your new surroundings; but as you gain confidence you will find your interest in your work increasing with its success.

Likely enough you will make mistakes—we all do; you must do your best, and if you do that you will not be without encouragement. Robert Louis Stevenson wrote: "When I see a man who doesn't think pretty well of himself, I always suspect him of being in the right." It is well if you are able to maintain a moderately good opinion of yourself; people will be dangerously apt to believe you if you decry yourself, though, on the other hand, they will not tolerate too much conceit.

One difficulty which will confront you is that you will commonly find in announcements regarding vacancies for chemists a statement to the effect that previous experience is necessary. I am frequently asked, "How then is the newly qualified chemist to make a start?" and the question is not easy to answer; but I suggest that during the third and fourth

year of your training you should begin to think of specialisation, and it will at least be a help to you to show that you have special knowledge, if not special experience, in at least one department of chemical work. You must be a good "all round" chemist, but it is essential to be able to say that you have paid special attention to, say, physical chemistry and higher physics, or to bio-chemistry and biology, or to mineral chemistry and mineralogy, or to metallurgical chemistry, or to problems connected with fuel, oil, leather, or some other well-known industry.

Some who have means may be able to enter laboratories where there is marked specialisation, paying a premium for a year or so; others may occasionally be allowed to gain experience on reciprocal terms, giving their services, or earning at first but a moderate salary. Such a course may be necessary when the demand for assistants is small. Others again may be fortunate in securing grants for research work bearing on industrial matters, and by this means acquire some degree of experience in preparation for an opening in the particular industry when it is offered.

Remember, too, that if at the end of a year or so you find you are not getting on, and your prospects are small, it is your business to remedy the situation. If you are in the wrong path the sooner you get into the right one the better. Do not blame others if you do not get on: it is your business.

I should not neglect to say a few words on the advisability—apart from the desirability—of the chemist taking a lively interest in the affairs of his profession. I am not here to enlist recruits to the Institute, although I think it is well for all qualified chemists to take their part in supporting a body which exists for the public good quite as much as for the profession, apart from the fact that membership confers an unquestioned recognition of your status as a trained chemist; but I urge you all to join those bodies which are devoted to the interests of your science, to become active members, and to lose no opportunity of knowing as many as possible of the members of your chosen profession. To get

on in the world you must become known for your work, and, in the long run, you will succeed by proving your competence and capability.

The Institute can look back with satisfaction to its past record. The majority of the members of the profession, notwithstanding the characteristic independent individuality of chemists in general, realise the need for solidarity. The incorporation of the Institute under Charter from the Crown so long ago as 1885 has put the profession on a plane comparable with that of other professions, for membership of which definite technical training and tests are prescribed. All members of the profession, whether attached to the Institute or not, benefit directly by the position of public recognition which the Institute has laboured to maintain for the profession; but those who join it at least reap the advantage accruing from the fact that they are associated with the body to whom the public looks for competent and honest service.

It is necessary to have standards of training and examinations, and they may be interpreted in a liberal spirit; but it is useless to have them merely to disregard them. Membership of the Institute constitutes in a large measure recognition of status by a responsible body of professional opinion. It does not exist merely for examination and registration purposes. It is an organisation for the common good, and its activities benefit the interests of the whole profession.

Now, with regard to the future. The first and most obvious fact for the chemist to remember is that he will have to depend mainly on his own resources, and the next that, in these days, he will often find it necessary to take what work he can get—not necessarily in his favourite line, or at his own time, or in the district he would prefer, or at the salary he thinks he deserves. The great thing is to make a start. The Appointments Bureau of the College and the Appointments Register of the Institute will often be found helpful, and the advertisement pages of the technical and daily press should not be ignored. Apply for every vacancy for

which there is the least chance of securing a place on the short list, but do not expect many replies, because it is unusual for employers to answer more than five or six candidates for any post. I would suggest in every case, that you make a brief and concise statement containing the following particulars and obtain a number of neatly typed or mimeographed copies of it:—Name, address, age, education and training, qualifications, experience, if any—including military or other war service,—and references.

In answering an advertisement, send a neatly written covering letter, carefully expressed, to direct attention to your special claims for consideration as a candidate for the vacancy in view, and enclosing, when they are asked for, copies of one or two testimonials. Many people prefer to act as references, rather than to give testimonials, and I think this is the more satisfactory method of obtaining reliable evidence.

If the salary is specified in the announcement, the business is simplified. Otherwise, you may suggest the amount yourself, or you may ask that the matter may be left for consideration should you be afforded an interview. From a long experience in such matters I would say that employers have, at any rate in recent times, come to realise that it is better to pay a higher salary for the candidate they prefer, than to select one who happens to place a lower value on his services. For a chemist, newly qualified and without experience, but with a good college record, a salary of £300 to £350 has been frequently obtained since the armistice. Some have been more fortunate and some less; but the great thing is to secure a chance of proving your worth, especially in any concern which is likely to afford a prospect of advancement. "Beggars can't be choosers" and "A half-a-loaf is better than no bread" are two very trite sayings, and, after all, whatever bargain you make at the beginning, the main thing is to get to work, if you can.

The prevailing depression in industry has rendered it unusually difficult to place even some highly qualified and

experienced chemists; but I believe that many sound concerns which have come through the trying times of the past six months will look to chemists, in greater numbers, to help them in recovering their positions. In that event, the demand will still have to be considerable, because the output of newly graduated chemists has been much greater during the past two years than in any similar pre-war period.

My hopes for the further employment of chemists are based on the evident anxiety on the part of industries to take advantage of the help of science during the comparatively active period from the Armistice until the autumn of 1920. During that time the Institute of Chemistry passed through its Appointments Register 700 names of chemists who had been on active service or engaged on war work. These were not all members of the Institute; yet it is remarkable that, although the number exceeds one-fifth of the total roll of the Institute, only thirteen members were known to be actually without appointment in December, 1920. The position of chemistry to-day is not so serious as that of many other professions, but about eighty members are out of work, and the profession is receiving very considerable additions to its ranks from the output of new graduates in chemistry from the Universities.

For the present I can only advise you to take every reasonable step to get work, and, if you cannot get it in chemistry, try for any position affording useful experience in which you can "mark time" until conditions improve and you can find an opening in your own chosen career. A chance to gain an insight into business should form a valuable addition to your equipment, and you need not neglect your chemistry in your spare time.

On the subject of procedure in practice, I need not detain you for long. You belong to a country where "fair play" is the underlying principle of professional ethics as well as of sport. You are expected to refrain from any course of action which savours of taking an unfair advantage of any other member of the profession. For this reason, professional

men here do not advertise for practice, or seek to bring themselves into prominence by "trade puffs," or adopt any artifice of the charlatan. The degree of estimation in which the profession is held must be established by the standard adopted by its members. Not only must we pursue our own good with as little harm to others as possible, but stand together for mutual help, preserving an ungrudging recognition of the rights of others.

Finally, I would repeat that in professional work the result lies mainly in the effort of the individual. Professors may well be proud of those pupils who have achieved eminence; but, in the long run, they will be the first to admit that the pupils have made themselves.

The above abstract is published with the concurrence of Messrs. Constable & Co., publishers of *The Profession of Chemistry*, by Richard B. Pilcher. London, 1919.

Changes in the Register.

At the meetings of the Council held on October 28th and November 25th, 4 Associates were elected to the Fellowship; 140 Associates were elected; 100 new Students were admitted and 1 re-admitted.

The Institute has lost 6 Fellows and 1 Student by death.

Associates Elected to Fellowship.

- Dingwall, Andrew, Dominion Grain Research Laboratory, Postal Station "B," Winnipeg, Manitoba, Canada.
 Harwood, Samuel Davenport Fairfax, M.A., South-Eastern Agricultural College, Wye, Kent.
 Hepburn, Andrew, c/o Ross Smyth, Clyde Place, Perth.
 Turner, Eustace Ebenezer, B.A. (Cantab.), D.Sc. (Lond.), 39, Victoria Road, Chingford, London, E. 4.

New Associates.

- Alway, Herbert Henry Thomas, B.Sc. (Bris.), 141, Church Road, Redfield, Bristol.
 Angus, George Bagrie, B.Sc. (Edin.), 24, Clarence Street, Edinburgh.
 Armitage, Bernard, B.Sc. (Leeds), Westfield House, Rothwell, Leeds.
 Ayling, Ernest Edward, B.Sc. (Lond.), University College, Mount Pleasant, Swansea.
 Bagnall, Douglas James Talbot, 57, Alexandra Road, Reading.
 Bain, Miss Alice Mary, M.A., B.Sc. (Aberd.), Lady Hardinge Medical College, Delhi, India.
 Banks, Bernard George, A.C.G.F.C., 46, Montalt Road, Woodford Green, Essex.
 Barton-Browne, Gerald, A.C.G.F.C., 11, Northwick House, St. John's Wood Road, London, N.W. 8.
 Baxter, Reginald Robert, B.Sc. (Adelaide), 110, Melville Terrace, South Perth, Western Australia.
 Billett, Arthur William, B.Sc. (Bris.), 7, Sunnybank, Lyncombe Vale, Bath.
 Blackwell, Charles Alfred, B.Sc. (Vict.), Hawthorne Cottage, Handforth, near Manchester.
 Blakey, Robert Fitzjohn Wood, A.R.T.C., 17, Melville Terrace, Stirling, Scotland.
 Box, Ronald John, A.C.G.F.C., Elcheater, Arthur Road, Slough, Bucks.
 Bradshaw, Geoffrey Gordon, B.Sc. (Leeds), Callowell, near Stroud, Glos.
 Breare, Arnold, B.Sc. (Leeds), 6, Airville Terrace, Burley-in-Wharfedale, nr. Leeds.
 Brown, David Christie, B.Sc. (Glas.), 32, Windsor Street, Glasgow.

- Bruce, Robert Marshall, B.Sc. (N.Z.), A.R.S.M. (Lond.), Albert Road, Britannia Heights, Nelson, New Zealand.
- Burch, William John Nobbs, B.Sc. (Lond.), 28, Craven Park, Willesden, London, N.W. 10.
- Butler, Carlton, B.Sc. (Vict.), 23, Winifred Road, Urmston, nr. Manchester.
- Buttrick, Harold Pease, 15, Braemar Avenue, Wood Green, London, N. 22.
- Chapman, Ernest, B.Sc. (Vict.), 83, Roe Green, Worsley, nr. Manchester.
- Churchill, Ernest George, M.Sc. (Sheff.), 66, Victoria Avenue, East Ham, London, E. 6.
- Connell, James, B.Sc. (Glas.), 77, Fotheringay Road, Glasgow.
- Corran, John William, B.Sc. (Liv.), 86, Upper Hill Street, Prince's Park, Liverpool.
- Coxon, Thomas, B.A. (Cantab.), Daffodils, Winscombe, Somerset.
- Coysh, Reginald Henry, B.Sc. (Bris.), 15, Bellerton Road, Knowle, Bristol.
- Crawford, Archibald Barclay, B.Sc. (Glas.), Locher, Bridge-of-Weir, Renfrewshire.
- Crosbie-Oates, Raymond, B.Sc. (Liv.), The Chalet, Park West, Heswall, Cheshire.
- Currie, Archibald Neil, M.A., B.Sc. (Glas.), 44, Fisher Street, Dennistoun, Glasgow.
- Cutting, Cecil George, A.R.C.S., 47, Whitehall Park, Highgate, London, N. 19.
- Dale, Alfred John, B.Sc. (Vict.), 14, Uttoxeter Road, Longton, Stoke-on-Trent.
- Das, Chinnyan Kumara, B.A. (Madras), M.Sc. (Liv.), 37, Coltart Road, Princes Park, Liverpool.
- Dawe, Alfred Ernest, 43, Osmond Gardens, Wallington, Surrey.
- Dawson, Thomas Rayner, M.Sc. (Leeds), 128, North Street, Leeds.
- Dewhurst, Milton, B.Sc. (Vict.), 27, Beech Street, Padiham, Lanes.
- Donald, Maxwell Bruce, A.R.C.S., Box 233, Massachusetts Institute of Technology, Cambridge, U.S.A.
- Drummond, Arthur Johnstone, B.Sc. (Glas.), 4, Grantly Gardens, Shawlands, Glasgow.
- Evans, Thomas, B.Sc. (Wales), Danybryn, Furnace, Burry Port, Carm.
- Fairley, Henry, B.Sc. (Edin.), 6, Faraday Place, Addiewell, Midlothian, Scotland.
- Farrer, William John Gladstone, A.C.G.F.C., 1, Princes Parade, Finchley, London, N. 3.
- Francis, Marcus, B.Sc. (Vict.), 654, Leek Road, Stoke-on-Trent.
- Galletly, Charles Harvey, B.Sc. (Glas.), 960, Sauchiehall Street, Glasgow.
- Garnor, William Austin, B.Sc. (Liv.), 122, Alton Street, Crewe, Cheshire.
- Garrard, James Davis, B.A. (Oxon), The Willows, Kermington, Brocklesby, Lincs.
- Hampson, Cyril Garford, B.Sc.Tech. (Manc.), c/o The C.P.A., Ltd., The Central Laboratory, Rhodes, nr. Manchester.
- Harris, John Sargent, B.A. (Cantab.), 20, Essex Road, Rushden, Northants.

- Harris, Robert Austin Meire, B.A. (Oxon), Long Marton Rectory, Kirkby Thore, Penrith.
- Hatfield, John Smith, A.R.C.S., 3, St. George's Court, Gloucester Road, London, S.W. 7.
- Haworth, Robert Downs, M.Sc. (Viet.), 221, Stockport Road, Cheadle Hulme, Stockport.
- Hill, John Whitelaw, 9, Briarhill Road, Prestwick, Scotland.
- Hole, Stanley Reginald, A.R.C.S., 10, Ringstead Road, Catford, London, S.E. 6.
- House, Cyril John, A.R.C.S., 132, Hailsham Avenue, Streatham Hill, London, S.W. 2.
- Irvine, Frank Mouat, B.Sc. (Dun.), 30, Clayton Road, Jesmond, Newcastle-on-Tyne.
- Jamieson, Morris, A.R.C.S., 14, Deepark Gardens, Tolleross, Glasgow.
- Jeffrey, John George Alexander, B.Sc. (Edin.), c/o The Attoch Oil Co., Ltd., Rawal Pindi Refinery, Rawal Pindi, Punjab, India.
- Jones, Daniel Evans, B.Sc. (Wales), Coedhir, Dolygaer, Merthyr Tydfil.
- Jones, David Thomas, B.Sc. (Wales), Tynlofft Farm, Lampeter, Cardiganshire.
- Jones, Edward Henry Carley, A.R.C.S., 62, Killieser Avenue, London, S.W. 2.
- Jones, Leonard Ellwood, B.Sc. (Liv.), 55, Belmont Drive, Newsham Park, Liverpool.
- Jones, Richard Arthur, A.C.G.F.C., 68, Highbury New Park, London, N. 5.
- Kieran, Alfred Joseph, B.Sc. (Liv.), 39, Valley Road, Anfield, Liverpool.
- Kinkead, Robert William, M.Sc. (Belfast), Hollymount, Osborne Park, Belfast.
- Kotibhaskar, Moreshvar Ganesh, M.A. (Bombay), M.Sc. (Manc.), 94, Market Street, Manchester.
- Ledbury, Wilfrid, B.Sc. (Birm.), 104, Evesham Street, Redditch, Worcs.
- Lockhart, Thomas Thomson Rankin, M.C., M.A., B.Sc. (Edin.), 6, Ryehill Avenue, Leith, Scotland.
- Lunt, James Gilbert, B.Sc. (Liv.), 17, York Avenue, Sefton Park, Liverpool.
- Macdonald, Charles Leonard, Fernlea, Glasgow Road, Paisley, Scotland.
- Mair, John Alexander, B.Sc. (Glas.), 53, Holmhead Street, Glasgow.
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- Martindale, John Ruthven, B.A. (Cantab.), 12, Dane's Road, Staveley, Westmorland.
- Mason, Cyril Thomas, B.A. (Cantab.), 13, Oakdale Road, Tmbridge Wells.
- Matthews, David Ernest, B.Sc. (Sheff.), B.Sc. (Lond.), Woodside, Barrack Hill, Newport, Mon.
- Matthews, Norman Louis, A.C.G.F.C., 45, Tyrwhitt Road, Brockley, London, S.E. 4.
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- Mennell, Harold, A.M.S.T., Dobroyd, Shepley, nr. Huddersfield.
- Miller, Ralph William Richardson, B.A. (Cantab.), P.O. Box 141, Nairobi, British East Africa.
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- Morgan, Frank Ewen, A.R.C.S., 6, Pavilion Parade, Brighton.
- Morgan, Richard Harold, B.Sc. (Manc.), Broneirion Cottage, Llandinam, Montgomeryshire.
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- Morton, Richard Alan, B.Sc. (Liv.), 2, Lumley Street, Garston, Liverpool.
- Muir, Thomas Agnew, B.Sc. (Liv.), 126, Rice Lane, Walton, Liverpool.
- Murdoch, Donald George, B.Sc. (Lond.), A.C.G.F.C., 26, Olive Road, Cricklewood, London, N.W. 2.
- Myers, George Norman, B.Sc. (Dun.), Elmsyde, Low Fell, Co. Durham.
- Norris, Woodford Stanley Gowan Plucknett, B.Sc., A.R.C.S. (Lond.), 66, Park Avenue, Barking, Essex.
- Parsons, Ian Herbert, A.R.C.S., 54, Queen Anne Street, London, W. 1.
- Patterson, Miss Agnes Margaret, B.Sc. (Glas.), Coltpark Avenue, Bishopbriggs, Glasgow.
- Payne, John William, Nazeing Park Gardens, Waltham Cross, Essex.
- Peake, John Griffith, A.R.C.S., Erskine, Prospect Road, Summer Hill, Sydney, Australia.
- Peard, George Thomas, B.Sc. (Liv.), Heyes House, Rainhill, Lincs.
- Pennel, Alexander Norval, B.Sc. (Edin.), Norvale, Innerleithen, Peebleshire.
- Phillips, Lewis Henry, M.C., B.Sc., A.R.C.S. (Lond.), 2, Adys Lawn, Balmoral Road, London, N.W. 2.
- Phillips, Lewis Reginald, York Villa, Goudhurst, Kent.
- Prescott, James Arthur, M.Sc. (Manc.), Sultanic Agricultural Society, P.O., Box 63, Cairo, Egypt.
- Preston, Harry, B.Sc. (Dun.), 5, Ash Street, Benwell, Newcastle-on-Tyne.
- Print, Harold Celestine, B.Sc. (Birm.), 69, Selsey Road, Edgbaston, Birmingham.
- Rideout, Eric Hardwicke, B.Sc. (Liv.), 17, Regent Road, Wallasey, Cheshire.
- Robertson, John McGregor, B.Sc. (Glas.), 50, Bank Street, Hillhead, Glasgow.
- Robinson, Fred, M.Sc. (Leeds), 32, Hovingham Grove, Harehills, Leeds.
- Russell, George Allan, B.Sc. (Dun.), Barnsbeen, Ditton, nr. Widnes.
- Scarf, Frank, B.Sc. (Birm.), 51, High Street, Harborne, Birmingham.
- Scott, John Richard, B.Sc. (Leeds), 12, Roundhay Crescent, Harehills Lane, Leeds.
- Scott, Marcellius James, B.A. Agric. (Cantab.), The Mount, Station Road, Harpenden, Herts.
- Skelton, John Scowcroft, A.R.C.S., 38, Ennerdale Road, Richmond, Surrey.
- Smith, Donald Alford, A.C.G.F.C., 138, Portway, West Ham, London, E. 15.
- Smith, Douglas Gordon, A.R.C.S., Hucclecote Lodge, Hucclecote, nr. Gloucester.
- Southall, Colin Lambert, B.Sc. (Birm.), 39, Gough Road, Edgbaston, Birmingham.

- Sparrow, Samuel, M.C., Thorne House, Romiley, Cheshire.
- Spencer, George Douglas, B.Sc. (Leeds), Calcutta, Yeadon, nr. Yorks.
- Spettigue, Philip Roy Spencer, A.R.C.S., 205, Hampstead Way, Golders Green, London, N.W. 11.
- Stocker, Charles Frederick, A.R.C.S., 21, Sunderland Terrace, London, W. 2.
- Stuart, Leslie Donald, A.C.G.F.C., 147, Breakspears Road, Brockley, London, S.E. 4.
- Stubbs, James Arthur, B.Sc. (Lond.), Castle Coombe, Southsea Avenue, Leigh-on-Sea, Essex.
- Swan, Enoch, B.Sc. (Vict.), 129, Liverpool Road, Birkdale, Southport.
- Taylor, Leslie Richard Gunn, A.R.C.S., School House, Bishop's Tawton, Barnstaple.
- Thomas, Miss Ethel Mary, B.Sc. (Lond.), 179, Albert Road, Alexandra Park, London, N. 22.
- Thomas, Garfield, B.Sc. (Manc.), 20, College Street, Aberdare, Glam.
- Thomas, Theodore Charles, Wynscoate, London Road, Reigate, Surrey.
- Turner, Sydney Leonard, B.A. (Oxon), 56, Abbey Road, Oxford.
- Urquhart, Alexander Robert, B.Sc. (Edin.), 106, Marchmont Road, Edinburgh.
- Vincent-Daviss, Cedric Arthur, B.Sc. (Birm.), 473, Gillott Road, Edgbaston, Birmingham.
- Walker, Ernest, B.Sc. (Liv.), 68, Crawford Avenue, Sefton Park, Liverpool.
- Walthew, Reginald Carrington, 3, Holly Bank, Derbyshire Road, Sale, Cheshire.
- Warren, Frederick William, B.Sc.Tech. (Manc.), 11, Glen Eldon Road, St. Anne's-on-Sea, nr. Blackpool.
- Watkins, Cyril Mercer, B.Sc. (Bris.), The New Inn, Leadhouse Road, Easton, Bristol.
- Watson, David, B.Sc. (Glas.), 118, Onslow Drive, Dennistoun, Glasgow.
- Waygood, William Arthur, A.R.C.S., B.Sc. (Lond.), 134, Braidwood Road, Catford, London, S.E. 6.
- Webster, David Mackay, B.Sc. (Edin.), 17, Watson Street, Falkirk, Scotland.
- Webster, James Davidson, B.Sc. (Glas.), 39, Partickhill Road, Glasgow, W.
- Weinberg, Leo, B.A. (Cape of Good Hope), M.Sc., 5, Little Russell Street, London, W.C. 1.
- Wenyon, Conrad Gallimore, M.A., B.Sc. (St. Andrew's), 58, Bankfield Road, Huddersfield.
- Whalley, Wilfred, B.Sc., M.Ed. (Vict.), 35, Montague Street, Glasgow, W.
- Whattam, Thomas William, M.Sc. (Leeds), 17, Leeds Road, Dewsbury, Yorks.
- Whitehead, Hugh Robinson, B.Sc. (Leeds), Dept. of Bacteriology, College of Medicine, Newcastle-on-Tyne.
- Whiting, William Henry, B.Sc. (Wales), 13, Manvers Street, Bath, Somerset.
- Willgress, Robert Ernest, A.R.C.S., 95, Beaconsfield Road, Enfield Wash, Middlesex.

- Willimott, Stanley Gordon, B.Sc. (Liv.), 25, Courtland Road, Mossley Hill, Liverpool.
 Wolstenholme, Miss Margery Ellen, B.Sc. (Wales), 238, Cambridge Road, Canton, Cardiff.
 Wood, Charles Goldstraw, M.Sc. Tech. (Mane.), 371, Manchester Road, Heaton Chapel, Stockport.

New Students.

- Afford, Howard Tebbutt, 27, Handen Road, Lee, London, S.E. 12.
 Allison, Cowan, 68, Neilstan Road, Paisley, Scotland.
 Amos, Arthur James, Douglas Cottage, Shore Road, Stevenston, Ayrshire.
 Bailey, Douglas Thomas Patrick, 39, Ifield Road, West Brompton, London, S.W. 10.
 Barr, James Cruikshank, Morven, Hillpark, Newlands, Glasgow.
 Barr, John Donald, Morven, Hillpark, Newlands, Glasgow.
 Bartholomew, John William, 6, Circus Drive, Dennistoun, Glasgow.
 Batstone, Sydney George, 14, Westover Road, Wandsworth Common, London, S.W. 18.
 Bertram, David Craig, The Schoolhouse, Glencorse, Midlothian.
 Blaylock, Thomas Egglestone, Post Office, Brotton, Yorks.
 Bleasdale, Frank, 6, Roney Street, Blackburn.
 Campbell, Duncan Arthur, Roseleigh, Speldhurst, Kent.
 Carswell, Alexander, Rannoch, North Iverton Road, Johnstone.
 Carter, George Arthur Joseph, Sandunes, Crosby Road, Seaforth, Liverpool.
 Chilvers, Cecil, High Street, Ringwood.
 Chitson, William Abell, 294, Old Ford Road, Bow, London, E. 3.
 Clarke, Ralph Butler, Necton, Swaffham, Norfolk.
 Collins, William Thomas, Ravenhill, Fforestfach, Swansea.
 Curnow, Hugh John, 22, Half-way Street, Lamorbey, Sidecup.
 Davies, David Cyril, Gwentfwrdd, Fforestfach, Swansea.
 Davies, George Parker, 16, Montpelier Terrace, Swansea.
 Davies, John Gower, 36, Rhyddings Park Road, Byrnmill, Swansea.
 Dolphin, Joseph Raymond, 23, Carless Avenue, Harborne, Birmingham.
 Duck, Albert Edward, 34, College Road, Saltley, Birmingham.
 Dyer, Frederick John, 4, St. Mildred's Road, Westgate-on-Sea.
 Elphick, Bernard Laurence, Miami, Chaucer Road, Ashford, Middlesex.
 Ewbank, Richard Maurice George, 209a, Gleneldon Mews, Streatham, London, S.W. 16.
 Finn, Douglas Hart, 17, Gt. Russell Street, Birmingham.
 Finney, Francis Norman Macleod, 5, Warehouse Road, Wath-on-Dearne nr. Rotherham.
 Fry, Gilbert Evan Reeves, Egremont, St. Catherine's, Lincoln.
 Fryer, Ernest Gladstone, 43, Drynham Road, Trowbridge, Wilts.
 Garlick, Cyril Tom Anton, 140, Portsdown Road, Maida Vale, London, W. 9.
 Garlick, Harvey Satchell, 19, Barrowgate Road, Chiswick, London, W. 4.
 Gibson, Reginald Oswald, 43, Crystal Palace Road, London, S.E. 22.

- Goodman, Albert de Bussy, 210, Goswell Road, London, E.C. 1.
 Grieve, Harry Osburn, The Square, Kirkliston, Linlithgowshire.
 Haigh, Herbert, 22, Sark Road, Stoneycroft, Liverpool.
 Hall, James, Doveleigh, Hall Lane, Hindley, nr. Wigan.
 Happold, Frank Charles, Ostley House, Abbey Road, Barrow-in-Furness.
 Harrison, Harold Ainsworth, Bobbin Hall, Blackrod, nr. Chorley, Lanes.
 Heap, Joseph Greenwood, 22, Kingswood Road, Clapham Park, London, S.W. 2.
 Hegan, Walter Gerald, 2, Widdrington Road, Coventry.
 Holmes, Eusebius, Eastern Green, nr. Coventry.
 Hope, Thomas, 382, Leigh Road, Daisy Hill, nr. Bolton, Lanes.
 Kenward, John Raymond, 17, Troutbeck Road, New Cross Gate, London, S.E. 14.
 King, Cecil Edward Wilson, 25, Susans Road, Eastbourne.
 Knowles, William Maurice Foster, 1, Lewes Road, Eastbourne.
 Knox, Robert, 3, Newton Terrace, Paisley.
 Lauchlan, Alexander David Elmsly, 90, South Side, Clapham Common, London, S.W. 4.
 Lowdell, Donald Percival, Benefield Road, Oundle, Northants.
 Lowrie, Robert Austin, 34, St. Albans Road, Moseley, Birmingham.
 Mackey, Hugh McDonnell, Oulton, nr. Leeds.
 Maclean, Duncan, 20, Kelly Street, Greenock, Scotland.
 Macleod, Norman, Cliff House, Ravenscar, N. Yorks.
 Maddocks, John Robert, 6, Peduzzi Street, Queen's Park, Manchester.
 Mansfield, Samuel Alison, 20, Neeld Crescent, Hendon, London, N.W. 4.
 McColl, Miss Ada Frances, 12, New Stock Street, Paisley.
 McKean, John Brown, Williamsville, Hawkhead Road, Paisley, Scotland.
 Messenger, Thomas Herbert, Charnwood, Albion Road, Sutton, Surrey.
 Mitchell, Thomas James, 5, Glen Street, Greenock, Scotland.
 Moore, Eric Wilfred, 664, Chester Road, Erdington, Birmingham.
 Needham, Leonard William, 18, South Street, Harborne, Birmingham.
 Newman, Frederick William, 9, South View Road, Hunslet Carr, Leeds.
 Nicholls, Ronald George, The Bungalow, Thorndale Farm, Wallasey Road, Wallasey, Cheshire.
 Oldham, Maurice Charles, 100, Roose Road, Barrow-in-Furness.
 Olding, Guy Ernest, 3, Stafford Place, Queens Road, Richmond, Surrey.
 Peard, William Leopold, 42, Dingwall Road, Croydon, Surrey.
 Polglaze, Gordon Henry Francis, Beach House, Polkerris, Par Station, Cornwall.
 Powell, Cyril John, 24, Addison Street, Nottingham.
 Price, Ernest Arthur, 73, Holmleigh Road, Stamford Hill, London, N. 16.
 Rees, Ralph Llewellyn, Ty Gwyn, Pembroke Dock.
 Rees, Sidney Linton, Highgarth, Llansamlet, Swansea.
 Rees, William Everard, Milford House, Borough Road, Loughor, Glam.
 Roberts, Owen James, Eyresbury, 27, The Grove, Church End, Finchley, London, N. 3.
 Rothwell, Raymond Seymour, Beryldene, Lyndhurst Avenue, Mill Hill, London, N.W. 7.
 Sanford, Chris, 25, Campion Road, Putney, London, S.W. 15.
 Simon, Philip, 84, Duffryn Street, Ferndale, Rotherham.

- Smith, Ian Charles Park, 6, Dermody Gardens, Lewisham, London, S.E. 13.
 Snape, James Herbert, 59, Cowley Road, Walton, Liverpool.
 Somerville, Ian Campbell, Melville Cottage, Bonnyrigg, Midlothian.
 Southern, Arthur Edward, 349, Gillott Road, Edgbaston, Birmingham.
 Sowerbutts, Frank, 244, Wellington Road South, Stockport.
 Stead, George Harvard, 7, Grove Road, Wrexham.
 Stewart, John Young, 142, Bruntsfield Place, Edinburgh.
 Streather, Alee Thomas, Glendon, Hinckley Road, Nuneaton.
 Suttinstall, Clarence, 54, Coldeotes Avenue, Harehills, Leeds.
 Taylor, John Henry, 65, Berry Street, Coventry.
 Thomas, Alfred Morris, 34, Frederick Street, Rugby.
 Tucker, Norman Poulter, 8, Elmers Drive, Teddington, Middlesex.
 Venn, Roland John, Featherfield, Latchford, nr. Warrington.
 Viney, Humphrey Terence, Bramerton, Blakebrook, Kidderminster.
 Voelker, Eric, 7, Durham Villas, Kennington, London, W. 8.
 Waddoup, William Vincent, 56, Wellington Road, Handsworth Wood, Birmingham.
 Walton, Thomas, 444, Whalley New Road, Blackburn, Lanes.
 Whitehead, Alan Douglas, 45, Ringford Road, Wandsworth, London, S.W. 18.
 Whittom, Miss Florence Dorothy, 1, South Park Crescent, Seven Kings, Essex.
 Wilkins, Ernest Thomas, 96, St. Asaph Road, Brockley, London, S.E. 4.
 Williams, William Dudley, 17, Hawthorne Avenue, Swansea.
 Wilson, William Taylor, 20, Cemetery Road, Scunthorpe, Lincs.
 Young, Miss Martha, 85, Neilstan Road, Paisley, Scotland.

Student Re-registered.

- Warner, Bertrand Thomas, 214, Brecknock Road, N. 19.

DEATHS.

Fellows.

- Harry Ingle, D.Sc. (Leeds), Ph.D. (Munich).
 Walter Macfarlane.
 Francis William Passmore, Ph.D. (Würzburg).
 John Spiller.
 James William Westmoreland, A.R.S.M.
 Richard Lloyd Whiteley.

Student.

- Thomas Bruce Benstead.

Corrections for Register.

The following entries should be amended as under :—

Fellows.

- Bennett, George Maedonald, B.A., M.Sc. (Lond.), M.A. (Cantab.).
 Cox, Henry Edward, M.Sc., Ph.D. (Lond.).

Gibson, Professor Charles Stanley, O.B.E., M.A. (Cantab.), B.Sc. (Oxon), M.Sc.Tech. (Manc.).
 Honneyman, William, B.Sc. (Lond.).
 Johnston, John Haslam, M.Sc. (Vict.).
 Jordan, Louis Arnold, D.Sc., A.R.C.S. (Lond.), D.I.C.
 Nicholls, John Ralph, B.Sc. (Lond.)—date of election, 1913.
 Potter, Francis Martin, add c. 1918–21.
 Proctor, Charles, I.S.O.

Associates.

Christie, George Hallatt, M.Sc. (Sheff.).
 Crabtree, John Wallace, B.Sc. (Manc.).
 Cullinane, Nicholas M., M.Sc. (N.U.I.).
 Downs, Edgar Stanley, should read Downes, Edgar Stanley.
 Harding, Charles Thompson, B.A., M.Sc. (Q.U.B.), Rivington and Blackrod Grammar School, nr. Horwich, Lanes.
 Hughes, Edwin Burnhope, B.Sc. (Lond.).
 Morris, Edgar Ford, M.A. (Oxon.), 4 Albert Square, Manchester.
 Ogilvie, James Pettigrew, 2, St. Dunstan's Hill, London, E.C. 3.
 Perry, Guy Allan, B.A. (Cantab.).
 Saunders, Kenneth Herbert, B.Sc. (Lond.), B.A. (Cantab.).
 Thomas, John Sidney Gordon, D.Sc. (Lond.), B.Sc. (Wales), A.R.C.S.

Students.

Taylor, Leslie Richard Gunn, School House, Bishop's Tawton, Barnstaple, Devon.

Addresses Unknown.

The Registrar desires to ascertain the addresses of the following:—

FELLOWS.—H. J. Alford, K. C. G. Arbuthnot, A. C. Carter, Charles James, H. Stanley.

ASSOCIATES.—N. Asherson, F. L. Barrett, E. M. Beynon, I. V. Brown, S. E. Crook, J. F. P. Fielding, J. Gibbon, J. D. Hamer, L. H. Howlett, W. E. Lloyd, J. H. Macdonald, Allan Morton, J. M. McEntegart, J. F. Neilson, Eric Robinson, J. W. Roche, Herbert Savage, Charles Walker, Darcy Worcester.

Change of Name.

Alice May Marsden, Associate of the Institute, on her marriage,—
 Alice May Penney.

General Notices.

Examinations.—Examinations for the Associateship and Fellowship will be held at the Institute during the week commencing on the 27th March and 3rd April, 1922.

Candidates who desire to be examined must notify the Registrar before Monday, 20th February, 1922.

Notice to Associates.—Associates elected prior to January, 1919, who can produce evidence satisfactory to the Council that they have been continuously engaged in the study and practical applications of chemistry for at least three years since their election to the Associateship, can obtain from the Registrar particulars of the Regulations and forms of application for election to the Fellowship. (See p. 382.)

Appointments Register.—A Register of Fellows and Associates of the Institute of Chemistry who are available for appointments is kept at the Offices of the Institute. For full information, inquiries should be addressed to the Registrar.

Fellows and Associates are invited to notify the Institute of suitable vacancies for qualified chemists.

Registered Students in the last term of their college course may receive the Appointments Register of the Institute on the same terms as Fellows and Associates, provided that their applications for this privilege be endorsed by their Professors.

The Institute also maintains a Register of Laboratory Assistants who have passed approved Preliminary Examinations, and, in some cases, Intermediate Science Examinations. Fellows and Associates who are able to offer vacancies to such assistants are invited to communicate with the Registrar.

A number of Registered Students of the Institute desirous of gaining practical experience will be glad to have opportunities of working in private laboratories or works during vacations.

The Library.—The Library is open for the use of Fellows, Associates and Registered Students between the hours of 10 A.M. and 6 P.M. on week-days (Saturdays: 10 A.M. and 2 P.M.) except when examinations are being held.

Registered Students using the Library are informed that the Assistant Secretary may be consulted by those who desire advice with regard to books on subjects in which they are specially interested.

The Library of the Chemical Society is also available for the use of Fellows and Associates of the Institute wishing to consult or borrow books, from 10 A.M. to 9 P.M. on week-days (Saturdays from 10 A.M. to 5 P.M.).

Changes of Address.—In view of the expense involved through frequent alterations of addressograph plates, etc., Fellows, Associates and Registered Students who wish to notify changes of address are requested to give, as far as possible their *permanent* addresses for registration.

Notice to Associates.—Examinations for the Fellowship will be held during 1922 as under:—

Last date for Entries.	Period of Examination.
Monday, 20th Feb., 1922.	<div style="display: inline-block; vertical-align: middle; font-size: 4em; line-height: 1;">{</div> <div style="display: inline-block; vertical-align: middle;"> 27th to 31st March, 1922 3rd to 7th April, 1922 3rd to 7th July, 1922 10th to 14th July, 1922 </div>
Monday, 22nd May, 1922.	

Examinations in Biochemistry will be held in October only:—

Last date for Entries.	Period of Examination.
Mon., 25th Sept., 1922.	Wed., 18th Oct., 23rd to 27th Oct., 1922.

The branches of the examinations are:—

Branch A. INORGANIC CHEMISTRY.

Section I. MINERAL PRODUCTS.

Section II. METALLURGY.

Section III. MANUFACTURED PRODUCTS.

Branch B. PHYSICAL CHEMISTRY.

Branch C. ORGANIC CHEMISTRY.

Branch D. AGRICULTURAL CHEMISTRY.

Branch E. THE CHEMISTRY (including Microscopy) of FOODS AND DRUGS AND WATER.

Branch F. BIOCHEMISTRY (see para. 9).

Branch G. CHEMICAL ENGINEERING.

Associates who have been registered as such for three years are entitled to apply for admission to the examinations. In special cases the Council may permit Associates who have been registered for a lesser period to enter for examination, although they cannot be elected Fellows until they have been registered as Associates for three years.

Further particulars of the examination were published in *Part II. of the Journal*, 1920, and are contained in the Regulations, which can be obtained from the Registrar.

Benevolent Fund.—A form of subscription will be found on an advertisement page at the end of this Part of the Journal, after the Index.

District Members of Council.—The following have been returned unopposed, for election as District Members of Council at the Annual General Meeting to be held on 1st March, 1922:—

- (ii) Bristol and South-Western Counties: Robert Dexter Littlefield.
- (iii) Liverpool and North-West Coast: John Hanley.
- (iv) London and South-Eastern Counties: Alfred Vincent Elsdon, B.Sc.
- (v) Manchester and District: William Marshall.
- (vi) North - East Coast and Yorkshire: William McDonnell Mackey.
- (vii) Edinburgh and East of Scotland: Thomas William Drinkwater, L.R.C.P., L.R.C.S.
- (viii) Glasgow and West of Scotland: James Macleod.
- (ix) Wales and the County of Monmouthshire: George Rudd Thompson.
- (ix) Ireland: Alfred Godfrey Gordon Leonard,
A.R.C.S.I., B.Sc., Ph.D.

No District Member of Council has as yet been nominated for (i) Birmingham and Midlands, or (xi) The Overseas Dominions, the Empire of India, and Abroad.

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THE
INSTITUTE OF CHEMISTRY
OF
GREAT BRITAIN AND IRELAND.

FOUNDED OCTOBER, 1877.

INCORPORATED BY ROYAL CHARTER, JUNE, 1885.

REGISTER OF
FELLOWS, ASSOCIATES & STUDENTS
SEPTEMBER, 1921.

BY ORDER OF THE COUNCIL,

RICHARD B. PILCHER,
Registrar and Secretary.

30, RUSSELL SQUARE,
LONDON, W.C. 1.

Honorary Secretaries of Local Sections.

Birmingham and Mid- land.	
Bristol and South-West- ern Counties.	W. A. Storey, F.I.C., Home Cottage, Wick, near Bristol.
Edinburgh and East of Scotland.	B. D. W. Luff, F.I.C., 85, Ashley Terrace, Edinburgh.
Glasgow and West of Scotland.	T. A. Wilson, F.I.C., 91, New Road, Ayr.
Gretna and District ...	William Caw, F.I.C., c/o Ainsworth, 99, King Street, Crieff, Perthshire.
Ireland (Belfast) ...	Dr. W. H. Gibson, O.B.E., F.I.C., York Street Flax Spinning Co., Ltd., Belfast.
„ (Dublin) ...	Dr. A. G. G. Leonard, F.I.C., 18, Belgrave Road, Dublin.
Liverpool and North- Western Counties.	John Hanley, F.I.C., 7, University Road, Bootle, Liverpool.
London and South- Eastern Counties.	R. Leslie Collett, M.A., F.I.C., c/o The Institute of Chemistry.
Manchester and Dis- trict.	James Barr, B.Sc., A.I.C., The Bungalow, Waterside, Marple, Cheshire.
Newcastle-on-Tyne and North-East Coast.	Dr. J. H. Paterson, F.I.C., Neville Chambers, Westgate Road, Newcastle- on-Tyne.
South Wales ...	A. J. Shelton, F.I.C., 10, Park Road, Clydach, S.O., Glam.

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REGULATIONS RELATING TO THE REGISTER.

Inaccuracies in the Register should be reported immediately to the Registrar.

Resolution of Council, passed Friday, March 13th, 1891:—

“That in all future lists of Members of the Institute of Chemistry, no degree be inserted without the name of the University granting the degree being annexed; further, that no degree or other qualification be inserted unless it be shown to be genuine to the satisfaction of the Council.”

Resolution of Council, passed Friday, January 20th, 1893:—

“That, in future, all letters indicating Membership of any Society, except the Royal Society (London), be omitted in the Register from all names of Members of the Institute.”

By-law 66:—

“If any Fellow or Associate shall allow his Annual Subscription to be in arrear for one year, he shall be liable to be excluded from the Membership or to be suspended in the manner provided by Section 16 of the Charter.”

INSTITUTE OF CHEMISTRY

OF GREAT BRITAIN AND IRELAND.

OBJECTS AND POLICY OF THE INSTITUTE

Foundation.—The Institute of Chemistry was established in 1877, at which time there were comparatively few practitioners in chemistry other than professors in the Universities and Colleges. The Universities and Colleges, however, had begun to train students who intended to follow Chemistry as a profession, and a number of the scientific men of that time foresaw the need for founding an Institution which would supply a hall-mark of competency to practise. Their aim was to provide the Government and the public with the means of recognising those who had been properly trained and who had been proved to be competent by an impartial authority.

A nucleus was formed of chemists who had already established their positions, and a Council was elected, consisting of representatives of the various branches of the profession (analysts, consultants, government chemists, technologists and teachers of chemistry).

Incorporation by Royal Charter.—A scheme of training was immediately formulated, examinations were instituted, and in 1885 the Institute was granted a Royal Charter with definite authority to examine, to grant certificates of competency, and to register persons qualified to practise. The aims of the Institute as stated in the

Charter included the elevation of the profession of chemistry and the maintenance of the efficiency, integrity and usefulness of persons practising the same, by compelling the observance of strict rules of membership and by setting up a high standard of scientific and practical efficiency.

Present Position of the Institute.—The Institute has now a roll of over 3,400 Fellows and Associates, and of over 850 registered students.

The qualifications and examinations of the Institute have received the recognition of the principal Government Departments concerned with chemical appointments, including the Admiralty, the War Office, the Ministry of Munitions, the Government Chemist, the Ministry of Agriculture, the Ministry of Health, the Scottish Board of Health, the Local Government Board for Ireland, and the Colonial Office. The Institute has established examinations (on lines agreed upon with the Ministry of Health) which are accepted under the "Regulations as to Competency of Public Analysts," under the Sale of Food and Drugs Act, and about 96 per cent. of these appointments are held by Fellows of the Institute. The qualifications of the Institute (F.I.C. and A.I.C.) are also officially recognised by many other authorities both at home and in the Overseas Dominions.

The **Appointments Register** maintained by the Institute provides a means whereby Members can be informed of vacancies, and authorities and employers can obtain the services of chemists.

The Institute possesses excellent headquarters, with **Laboratories and Library**. Its office is available to Members and others requiring information and advice on matters of interest to chemists.

Local Sections.—Local Sections of the Institute have been formed in important centres. The main objects of

such sections are to maintain the interest of the Members in the general welfare of their profession and to promote social intercourse.

OUTLINE OF THE REGULATIONS.—In pursuance of the provisions of the Charter and Bye-Laws, the Council have made Regulations (outlined below) for the admission of Students, Associates and Fellows.

The Studentship.—A candidate* for registration as a Student of the Institute is required to produce evidence that he is over 16 years of age, and that he has passed a Preliminary Examination in subjects of general education, approved by the Council of the Institute. He must also show that, at the time of making application for registration, he is working at an institution recognised by the Council, or under the direction of a Fellow of the Institute, or in a laboratory or works approved by the Council, with the object of qualifying for the practice of Chemistry.

Qualifications for Associateship and Fellowship.—The extent of the training and the scope and character of the examinations for membership have been modified from time to time, in order to maintain a standard corresponding to the highest training obtainable in the country.

The method of conducting the examinations has given them a distinctly *practical* bias, and has exercised a decided effect on the advancement of higher education in chemical science, especially on the courses of those Universities and Colleges from which a steady entry of candidates has been maintained.

Candidates for **admission to the Associateship** are required to produce evidence of having passed an approved preliminary examination, but in special cases the Council consider other evidence of general education.

* Women are admitted to the Studentship, Associateship and Fellowship of the Institute.

The training for the Associateship extends over at least four years.

Admission to the **Examination for the Associateship** is open to :—

- (i.) candidates who have been systematically trained in a recognised University or College for at least four years in accordance with the Regulations;
- (ii.) candidates who have been trained partly in recognised Universities or Colleges and partly under Fellows of the Institute in laboratories or works;
- (iii.) candidates who have been otherwise trained to the satisfaction of the Council and who have been engaged in the study and practice of chemistry for at least ten years.

Admission to the **Associateship without Examination** may be granted to candidates who have obtained certain University degrees with 1st or 2nd Class Honours in Chemistry or other diplomas recognised by the Council.

Admission to the Fellowship is open by examination to Associates of three years' standing; or may be granted without examination, or with a modified examination, at the discretion of the Council, to Associates of three years' standing who—

- (i.) have carried out original research; or
- (ii.) have devised processes or inventions; or
- (iii.) have satisfied the Council that they are possessed of knowledge and ability equivalent to having fulfilled the conditions contained in (i.) and (ii.)

In special cases candidates who have been systematically trained, and who have had considerable experience, may be examined for the Fellowship without passing through the grade of Associateship.

ABSTRACTS FROM THE ROYAL CHARTER

14. Any person while being a Member of the Institute may use after his name the Initials (if he be a Fellow of the Institute) **F.I.C.** or (if he be an Associate of the Institute) **A.I.C.**

16. If any person while he is a Member of the Institute

- (1) Allows any person not being either a Member of the Institute or in Partnership with himself as an Analytical or Consulting Chemist to practise in his name as an Analytical or Consulting Chemist or
- (2) Is convicted of felony or misdemeanour or is finally declared by any Court of competent Jurisdiction to have committed any fraud or
- (3) Is held by the Council on the complaint of any Member of the Institute or of any person aggrieved to have been guilty of any act or default discreditable to the Profession of Analytical or Consulting Chemist or
- (4) Is adjudged Bankrupt or individually or as Partner makes an Assignment for the benefit of Creditors or under any resolution of Creditors or under the Order of a Court of Bankruptcy or under any deed or document has his estate placed in liquidation for the benefit of Creditors or makes any arrangement for payment of a composition to Creditors or
- (5) Shall engage in any occupation which in the opinion of the Council shall be inconsistent with his remaining a Member of the Institute or
- (6) Fails to pay any subscription or other sum payable by him to the Institute under this Our Charter or bye-laws of the Institute for one year after the same has become due

he shall be liable to be excluded from Membership or to be suspended for any period not exceeding two years from Membership by a resolution of the Council passed at a meeting specially convened for that purpose with notice of such purpose at which meeting there shall be present not less than eight of the Members of the Council and for which exclusion or suspension not less than three-fourths of those

present and voting shall vote, and the Member having first had an opportunity of being heard, but any such exclusion or suspension may be at any time revoked or modified by the Council at a like meeting by such a majority as aforesaid subject to such terms and conditions (if any) as the Council may think fit, and notice of any resolution for exclusion or suspension shall forthwith be sent to the person affected thereby.

17. If any person ceases for any cause whatever to be a Member of the Institute he shall not nor shall his representatives have any interest in or claim against the funds or property of the Institute nor shall he use any initials after his name implying that he is a Fellow or Associate of the Institute.

ABSTRACTS FROM THE BYE-LAWS.

45. Every person, prior to his admission as a Fellow or Associate, shall, in the presence of a witness, make and subscribe his name to the following declaration:—

“I (A. B.), of

“do solemnly and sincerely declare that while a Fellow (or
 “Associate) of the INSTITUTE OF CHEMISTRY, I will observe the
 “provisions of the Charter and By-laws thereof, and will conduct
 “myself honourably in the practice of my profession, and to the
 “utmost of my power will maintain the dignity and welfare of the
 “Institute.”

57. The following Acts are such as shall be deemed to be discreditable within the meaning of Section 16 (3) of the Charter* :—

(a) Unprofessional soliciting for practice.

(b) Unfair competition.

(c) Supplying to other persons not being qualified chemists, reports or certificates with the knowledge that these persons will issue such reports or certificates as their own work.

(d) Issuing or allowing to be issued reports or certificates intended for publication containing unjustifiable statements.

Provided that the above enumeration of Acts shall not be treated as exhaustive or in any manner limiting the interpretation of Section 16 (3) of the Charter.

* See p. 9.

LIST OF OFFICERS AND COUNCIL

For the Year ending March 1st, 1922.

PRESIDENT :

ALFRED CHASTON CHAPMAN, F.R.S.

VICE-PRESIDENTS :

HORATIO BALLANTYNE.
SIR HERBERT JACKSON, K.B.E., F.R.S.
ERNEST MOSTYN HAWKINS.
GILBERT THOMAS MORGAN, O.B.E., D.Sc., F.R.S.
WILLIAM MACNAB, C.B.E.
GEORGE STUBBS, C.B.E.

HON. TREASURER :

EDWARD WILLIAM VOELCKER, A.R.S.M.

MEMBERS OF COUNCIL :

WALTER ERNEST ADENEY, D.Sc., A.R.C.S.I.: (DUBLIN).
WILLIAM BACON, B.Sc.: (LONDON).
FRANCIS HOWARD CARR, C.B.E.: (LONDON).
ARTHUR JENNER CHAPMAN: (LONDON).
ALLIN COTTRELL, M.Sc.: (OLDHAM).
ALEXANDER CHARLES CUMMING, O.B.E., D.Sc.: (EDINBURGH).
FREDERICK GEORGE DONNAN, C.B.E., F.R.S.: (LONDON).
LEWIS EYNON, B.Sc.: (LONDON).
ALEXANDER FINDLAY, M.A., D.Sc., Ph.D.: (ABERDEEN).
FRANCIS ARTHUR FREETH, O.B.E., M.Sc.: (CHESHIRE).
GEORGE WATSON GRAY: (LIVERPOOL).
FRANK WILLIAM HARBORD, C.B.E., A.R.S.M.: (LONDON).
CHARLES ALEXANDER HILL, B.Sc.: (LONDON).
PATRICK HENRY KIRKALDY: (LONDON).
FREDERIC HERBERT LEES: (LONDON).
SAMUEL ERNEST MELLING: (MANCHESTER).
GORDON WICKHAM MONIER-WILLIAMS, O.B.E., M.C., Ph.D.:
HAROLD MOORE, O.B.E., B.Sc.: (LONDON). (LONDON).
ANDREW MORE, A.R.C.S.: (LONDON).
FREDERICK MOLLWO PERKIN, C.B.E., Ph.D.: (LONDON).
BENJAMIN DAWSON PORRITT, M.Sc.: (LONDON).
THOMAS SLATER PRICE, O.B.E., D.Sc., Ph.D.: (LONDON).
WILLIAM RINTOUL, O.B.E.: (AYRSHIRE).
WILLIAM HENRY ROBERTS, M.Sc.: (LIVERPOOL).
ERNEST WOODHOUSE SMITH, D.Sc.: (LONDON).
LEONARD ELLERTON VRIES: (MANCHESTER).
SIR JAMES WALKER, D.Sc., F.R.S.: (EDINBURGH).

DISTRICT MEMBERS OF COUNCIL :

THOMAS WILLIAM DRINKWATER, L.R.C.P., L.R.C.S.: (EDINBURGH).
ALFRED VINCENT ELSDEN, B.Sc.: (LONDON).
JOHN HANLEY: (LIVERPOOL).
ALFRED GODFREY GORDON LEONARD, A.R.C.S.I., B.Sc., Ph.D.:
JAMES MACLEOD: (GLASGOW). (IRELAND).
WILLIAM MARSHALL: (MANCHESTER).
CYRIL JOSEPH HEATH STOCK, B.Sc.: (NEWCASTLE).
GEORGE RUDD THOMPSON: (WALES).

CENSORS, 1921-1922.

THE PRESIDENT, *ex-officio*.SIR JAMES JOHNSTON DOBBIE, LL.D., D.Sc., F.R.S., *Past-President*.
BERNARD DYER, D.Sc.SIR HERBERT JACKSON, K.B.E., F.R.S., *Past-President*.

SIR ROBERT ROBERTSON, K.B.E., F.R.S.

BOARD OF EXAMINERS FOR THE ASSOCIATESHIP
AND FELLOWSHIP 1921-22.*Chairman:* THE PRESIDENT.*Members of Council:* ERNEST MOSTYN HAWKINS, PATRICK HENRY
KIRKALDY, AND BENJAMIN DAWSON PORRITT.*Examiners for the Associateship:*GENERAL CHEMISTRY: OSCAR LISLE BRADY, B.A., D.Sc.
SAMUEL SMILES, O.B.E., D.Sc., F.R.S.*Examiners for the Fellowship:*

Branch A.—INORGANIC CHEMISTRY:

Section I. Mineral Products: JOHN THOMAS DUNN, D.Sc.

Section II. Metallurgy: CECIL HENRY DESCH, D.Sc.

Section III. Manufactured Products: (Appointed as required.)

Branch B.—PHYSICAL CHEMISTRY: JOSEPH EDWARD COATES,
O.B.E., D.Sc.Branch C.—ORGANIC CHEMISTRY: JOCELYN FIELD THORPE, C.B.E.,
D.Sc., F.R.S.

Branch D.—AGRICULTURAL CHEMISTRY: BERNARD DYER, D.Sc.

Branch E.—CHEMISTRY (including Microscopy) of Food and Drugs and
Water: EDWARD HINKS, M.B.E., B.Sc.; Therapeutics,
Pharmacology and Microscopy: FREDERICK GOW-
LAND HOPKINS, D.Sc., M.B., F.R.S.

Branch F.—BIO-CHEMISTRY: ARTHUR HARDEN, D.Sc., F.R.S.

Branch G.—CHEMICAL ENGINEERING: (Appointed as required.)

HON. AUDITORS:

HENRY DROOP RICHMOND AND CHARLES THOMAS ABELL, M.Sc.

AUDITOR:

DAVID HENDERSON, Chartered Accountant.

REGISTRAR AND SECRETARY:

RICHARD BERTRAM PILCHER, O.B.E., Chartered Secretary.

ASSISTANT SECRETARY:

GEORGE STANLEY WITHERS MARLOW, B.Sc., F.I.C.

HONORARY CORRESPONDING SECRETARIES :

The main duties of the Honorary Corresponding Secretaries are to afford information to Candidates desirous of joining the Institute, and to advise the Council with respect to matters of local professional interest.

BRITISH EAST AFRICA.

VINCENT HENRY KIRKHAM, B.Sc.

THE COMMONWEALTH OF AUSTRALIA.

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SIR FREDERICK AUGUSTUS ABEL, Bart., K.C.B., G.C.V.O., D.C.L., F.R.S. (<i>Deceased</i> 1902)	1880-1883
WILLIAM ODLING, M.A., M.B., F.R.S. (<i>Deceased</i> 1921)	1883-1888
JAMES BELL, C.B., D.Sc., Ph.D., F.R.S. (<i>Deceased</i> 1908)	1888-1891
SIR WILLIAM AUGUSTUS TILDEN, LL.D., D.Sc., F.R.S.	1891-1894
WILLIAM JAMES RUSSELL, Ph.D., F.R.S. (<i>Deceased</i> 1909)	1894-1897
SIR THOMAS STEVENSON, M.D., F.R.C.P. (<i>Deceased</i> 1908)	1897-1900
JOHN MILLAR THOMSON, LL.D., F.R.S. ..	1900-1903
DAVID HOWARD (<i>Deceased</i> 1916) ..	1903-1906
PERCY FARADAY FRANKLAND, C.B.E., LL.D., Ph.D., F.R.S.	1906-1909
SIR GEORGE THOMAS BEILBY, LL.D., F.R.S.	1909-1912
RAPHAEL MELDOLA, D.Sc., LL.D., F.R.S. (<i>Deceased</i> 1915)	1912-1915
SIR JAMES JOHNSTON DOBBIE, LL.D., F.R.S.	1915-1918
SIR HERBERT JACKSON, K.B.E., F.R.S. ..	1918-1921
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PAST CENSORS :

SIR FREDERICK AUGUSTUS ABEL, Bart., K.C.B., G.C.V.O., D.C.L., F.R.S. (<i>Deceased</i> 1902)	1878-80, 1883-88
SIR GEORGE THOMAS BEILBY, LL.D., F.R.S. ..	1909-19
JAMES BELL, C.B., Ph.D., F.R.S. (<i>Deceased</i> 1908)	1884-94
EDWARD JOHN BEVAN	1917-18
RUSSELL FORBES CARPENTER (<i>Deceased</i> 1915)	1908-09
MICHAEL CARTEIGHE (<i>Deceased</i> 1910) ..	1891-92, 1893-95
CHARLES EDWARD CASSAL, Col., V.D. ..	1892-93
†ALFRED CHASTON CHAPMAN	1919-
SIR ARTHUR HERBERT CHURCH, K.C.V.O., M.A., D.Sc., F.R.S. (<i>Deceased</i> 1915) ..	1880-83
FRANK CLOWES, D.Sc.	1913-14
WARREN DE LA RUE, LL.D., F.R.S. (<i>Deceased</i> 1889)	1878-80
EDWARD DIVERS, M.D., D.Sc., F.R.S. (<i>Deceased</i> 1912)	1907-08
†SIR JAMES JOHNSTON DOBBIE, LL.D., F.R.S.	1915-
†BERNARD DYER, B.Sc.	1919-
MARTIN ONSLOW FORSTER, D.Sc., F.R.S. ..	1918-19
SIR EDWARD FRANKLAND, K.C.B., D.C.L., F.R.S. (<i>Deceased</i> 1899)	1880-89, 1892-98, 1899
PERCY FARADAY FRANKLAND, C.B.E., LL.D., Ph.D., F.R.S.	1906-1921
RICHARD JOHN FRISWELL (<i>Deceased</i> 1908) ..	1898-99

† In Office.

Past Censors —continued.

JOHN HALL GLADSTONE, Ph.D., F.R.S. (Deceased 1902)	1879-80, 1882-83, 1884-85
OTTO HEHNER	1901-03
DAVID HOWARD (Deceased 1916)	1889-92, 1894-1902, 1903-16
†Sir HERBERT JACKSON, K.B.E., F.R.S.	1918-
GEORGE MCGOWAN, Ph.D.	1914-15
RAPHAEL MELDOLA, D.Sc., LL.D., F.R.S. (Deceased 1915)	1912-15
WILLIAM ODLING, M.A., M.B., F.R.S. (Deceased 1921)	1878-80, 1882-91
JOHN PATTINSON (Deceased 1912)	1880-82
Sir WILLIAM RAMSAY, K.C.B., LL.D., Ph.D., F.R.S. (Deceased 1916)	1890-91, 1906-10
*Sir ROBERT ROBERTSON, K.B.E., F.R.S.	1921
Sir HENRY ENFIELD ROSCOE, LL.D., F.R.S. (Deceased 1915)	1878-79, 1883-84
WILLIAM JAMES RUSSELL, Ph.D., F.R.S. (Deceased 1909)	1885-90, 1894-1904
Sir THOMAS STEVENSON, M.D., F.R.C.P. (Deceased 1908)	1889-90, 93-94, 95-1907
JOHN MILLAR THOMSON, LL.D., F.R.S.	1900-12
Sir THOMAS EDWARD THORPE, C.B., LL.D., Ph.D., F.R.S.	1890-92
Sir WILLIAM AUGUSTUS TILDEN, LL.D., D.Sc., F.R.S.	1891-1901, 1902-06, 1910-13
AUGUSTUS VOELCKER, Ph.D., F.R.S. (Deceased 1884)	1883-1884
EDWARD WILLIAM VOELCKER, A.R.S.M.	1916-1918
JOHN AUGUSTUS VOELCKER, M.A., Ph.D., B.Sc.	1904-1906
JOHN THOMAS WAY (Deceased 1883)	1880-1882

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*CHARLES ROMLEY ALDER WRIGHT, D.Sc., F.R.S. (Deceased 1894)	1877-1885
*DAVID HOWARD (Deceased 1916)	1885-1903
*ALFRED GORDON SALAMON, A.R.S.M. (Deceased 1918)	1903-1918
*†EDWARD WILLIAM VOELCKER, A.R.S.M.	1918-

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GEORGE HENRY ROBERTSON, <i>Registrar and Secretary</i> (Deceased 1904)	1892-1894
*JOHN MILLAR THOMSON, LL.D., F.R.S., <i>Registrar and Secretary</i>	1894-1895
*JOHN MILLAR THOMSON, LL.D., F.R.S., <i>Registrar</i>	1894-1900
RICHARD BERTRAM PILCHER, <i>Secretary</i>	1895-1900
†RICHARD BERTRAM PILCHER, O.B.E., <i>Registrar and Secretary</i>	1900-

PAST EXAMINERS :

WILLIAM JAMES RUSSELL, Ph.D., F.R.S. (<i>Deceased</i> 1909)	..	1878-1880
WILLIAM RICHARD EATON HODGKINSON, C.B.E., Ph.D.	..	1880-1882
CHARLES GRAHAM, D.Sc. (<i>Deceased</i> 1909)	..	<i>London</i>
SIR WILLIAM AUGUSTUS TILDEN, LL.D., D.Sc., F.R.S.	<i>Birmingham</i>	
SIR WILLIAM RAMSAY, K.C.B., LL.D., Ph.D., F.R.S.		
(<i>Deceased</i> 1916)	..	<i>Bristol</i>
SIR WALTER NOEL HARTLEY, D.Sc., F.R.S. (<i>Deceased</i> 1913)	..	1883-1887
EDMUND JAMES MILLS, D.Sc., F.R.S. (<i>Deceased</i> 1921)	..	<i>Dublin</i>
WATSON SMITH (<i>Deceased</i> 1920)	..	<i>Glasgow</i>
JOHN MILLAR THOMSON, LL.D., F.R.S.	..	<i>Manchester</i>
JOHN MILLAR THOMSON, LL.D., F.R.S.	..	1887-1888
WILLIAM WALTER JAMES NICOL, M.A., D.Sc.	..	<i>London</i>
SIR WALTER NOEL HARTLEY, D.Sc., F.R.S. (<i>Deceased</i> 1913)	..	<i>Birmingham</i>
EDMUND JAMES MILLS, D.Sc., F.R.S. (<i>Deceased</i> 1921)	..	<i>Dublin</i>
JAMES CAMPBELL BROWN, LL.D., D.Sc. (<i>Deceased</i> 1910)	..	<i>Glasgow</i>
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THOMAS FAIRLEY (<i>Deceased</i> 1919)	..	<i>Manchester</i>
THOMAS FAIRLEY (<i>Deceased</i> 1919)	..	<i>Leeds</i>
WYNDHAM ROWLAND DUNSTAN, C.M.G., M.A., LL.D., F.R.S.	..	1891-1892
	..	1892-1895
	..	1892-1896

FOR THE INTERMEDIATE AND FINAL EXAMINATIONS: 1895-1907.

WYNDHAM ROWLAND DUNSTAN, C.M.G., M.A., LL.D., F.R.S.	..	1895-1896
OTTO HEHNER	..	1895-1899
PERCY FARADAY FRANKLAND, C.B.E., LL.D., Ph.D., F.R.S.	..	1896-1900
BERNARD DYER, D.Sc.	..	1899-1903
WILLIAM PALMER WYNNE, D.Sc., F.R.S.	..	1900-1904
WALTER WILLIAM FISHER, M.A. (<i>Deceased</i> 1920)	..	1903-1907
GEORGE GERALD HENDERSON, M.A., D.Sc., LL.D., F.R.S.	..	1904-1907

FOR THE INTERMEDIATE EXAMINATION AND GENERAL CHEMISTRY.

GEORGE GERALD HENDERSON, M.A., D.Sc., LL.D., F.R.S.	..	1907-1908
BERTRAM BLOUNT (<i>Deceased</i> 1921)	..	1907-1911
SIR HERBERT JACKSON, K.B.E., F.R.S.	..	1908-1912
ALFRED CHASTON CHAPMAN, F.R.S.	..	1911-1915
ARTHUR WILLIAM CROSSLEY, C.B.E., C.M.G., D.Sc., Ph.D., F.R.S.	..	1912-1921
HAROLD GOVETT COLMAN, Ph.D., D.Sc.	..	1915-1921

FOR THE FINAL EXAMINATION.

(MINERAL CHEMISTRY.)

BERTRAM BLOUNT (<i>Deceased</i> 1921)	..	1907-1911
SIR HERBERT JACKSON, K.B.E., F.R.S.	..	1911-1915
GEORGE NEVILL HUNTLY, B.Sc., A.R.C.S.	..	1915-1921

METALLURGICAL CHEMISTRY.)

FRANK WILLIAM HARBORD, C.B.E., A.R.S.M.	..	1907-1911
GEORGE THOMAS HOLLOWAY, A.R.C.S. (<i>Deceased</i> 1917)	..	1911-1915
†CECIL HENRY DESCH, D.Sc., Ph.D.	..	1915-

(PHYSICAL CHEMISTRY.)

THOMAS SLATER PRICE, O.B.E., D.Sc., Ph.D.	..	1907-1911
ALEXANDER FINDLAY, M.A., D.Sc., Ph.D.	..	1911-1915
FREDERICK GEORGE DONNAN, C.B.E., Ph.D., F.R.S.	..	1915-1919
†JOSEPH EDWARD COATES, O.B.E., D.Sc.	..	1919-

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(ORGANIC CHEMISTRY.)

GEORGE GERALD HENDERSON, M.A., D.Sc., F.R.S.	1907-1908
WILLIAM HENRY PERKIN, LL.D., Ph.D., F.R.S.	1908-1912
JOHN NORMAN COLLIE, LL.D., Ph.D., F.R.S.	..	..	1912-1913
Sir WILLIAM JACKSON POPE, K.B.E., M.A., M.Sc., F.R.S.	..	..	1913-1919
†JOCELYN FIELD THORPE, C.B.E., F.R.S.	..	..	1919-

(THE CHEMISTRY (AND MICROSCOPY) OF FOOD AND DRUGS, FERTILISERS AND FEEDING STUFFS, SOILS, AND WATER.)

CECIL HOWARD CRIBB, B.Sc.	..	..	..	..	1907-1911
PERCY ANDREW ELLIS RICHARDS	1911-1915
BERNARD DYER, D.Sc.	1915-1921

(BIOLOGICAL CHEMISTRY.)

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GILBERT JOHN FOWLER, D.Sc.	1910-1914
ALFRED CHASTON CHAPMAN, F.R.S.	1914-1919
†ARTHUR HARDEN, D.Sc., Ph.D., F.R.S.	1919-

(THERAPEUTICS, PHARMACOLOGY, AND MICROSCOPY.)

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EXAMINERS. 1921. see p. 12.

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A

- 1905 *Abell, Charles Thomas, M.Sc. (Vict.), 68, Trinity Rise, Tulse Hill, London, S.W. 2.
- 1903 Abell, Robert Duncombe, D.Sc. (Wales), Ph.D. (Leipzig), The Technical College, Bradford.
- 1888 *Abraham, Alfred Clay, 87, Bold Street, Liverpool.
- 1878 Acworth, Joseph John, Ph.D. (Erlangen), Thornbank, Shootup Hill, Brondesbury, London, N.W. 3.
- 1917 Adam, Hector Robert, Metallurgical Department, School of Mines, P.O. Box 1176, Johannesburg, South Africa.
- 1919 Adam, Matthew Atkinson, B.Sc. (Glas.), 57 and 58, Lincoln's Inn Fields, London, W.C. 2; and 6, Featherstone Buildings, High Holborn, London, W.C. 1.
- 1897 *Adams, Arthur, Kelvin House, Edgbaston Road, Smethwick, near Birmingham.
- 1893 Addyman, Frank Thornton, B.Sc. (Lond.), Stationers' School, Ridge Road, Hornsey, London, N. 8.
- 1887 *Adeney, Walter Ernest, Hon. D.Sc. (R.U.I.), A.R.C.S.I., Burnham, Queen's Park, Monkstown, Co. Dublin. [*c.* 1899–1901, 20; *v.p.* 1901–4.]
- 1919 Adie, Richard Haliburton, M.A. (Cantab.), B.Sc. (Lond.), 136, Huntingdon Road, Cambridge.
- 1913 Akers, Noel Charles, D.S.C., 48, Victoria Avenue, Hull.
- 1892 Albuquerque, Professor John Pedrozo d', M.A. (Cantab.), Government Laboratory, Barbados, West Indies.
- 1888 *Alcock, Frank Harris, 5, King Alfred's Place, Broad Street, Birmingham.
- 1905 Alderton, Gilbert John, B.Sc. (Lond.), 68, Dunvegan Road, Eltham, London, S.E. 9.
- 1917 Alexander, Thomas James Roland, B.A. (Oxon), B.Sc. (Lond.), Airlie, 47, Eglinton Road, Ardrossan.
- 1900 Alford, Henry James, M.D. (Lond.), M.R.C.S. (Eng.), L.S.A. (Lond.)
- 1880 *Alison, Robert Edward, 28, Morland Road, Croydon, Surrey.
- 1908 Allan, David, 42, Cavendish Drive, Rock Ferry, Cheshire.

- 1913 *Allen, Harry Leonard, B.Sc. (St. Andrews), 139, De Lacy Avenue, Plainfield, New Jersey, U.S.A.
- 1918 Allen, William Stow, c/o Miss Cochrane, 1, Westhall Gardens, Edinburgh.
- 1920 Allmand, Professor Arthur John, D.Sc. (Liv.), King's College, Strand, London, W.C. 2.
- 1907 Alton, William Lester St. John, c/o The Radium Institute, 16, Riding House Street, Portland Place, London, W. 1.
- 1919 Amooore, Ronald Lewis, Rothamsted Experimental Station, Harpenden, Herts.
- 1917 Anderson, Edward, 1, White's Terrace, Waun Wen Road, Swansea.
- 1919 Anderson, Edward, 49, Briarbank Terrace, North Merchiston, Edinburgh.
- 1917 Anderson, Edward Bertram, B.Sc. (Lond.), M.Sc. (Birm.), c/o Messrs. Levinstein, Ltd., Blackley, Manchester.
- 1893 Anderson, Frederic Alfred, B.Sc. (Lond.), 6, South Square, Gray's Inn, London, W.C. 1.
- 1918 Andrew, George William, M.Sc. (Manc.), c/o Federation of British Industries, 39, St. James Street, London, S.W. 1.
- 1898 Andrews, Edmund Alibert, 97, Kingswood Road, Moseley, Birmingham.
- 1901 Andrews, Ernest Robert, 4, Druce Road, Dulwich Village, London, S.E. 21.
- 1914 *Andrews, William Owen, A.R.C.S. (Lond.), c/o Victoria Falls and Transvaal Power Co., Johannesburg, South Africa.
- 1919 Anfilogoff, Nicholas Alexander, Lathol House, Thames Haven, Essex.
- 1878 Angell, Arthur, Regent's Park, Southampton.
- 1906 Annan, John Grieg, B.Sc. (Lond.), 2, Shandon Terrace, Edinburgh.
- 1913 Annett, Harold Edward, B.Sc. Agric., D.Sc. (Lond.), Agricultural College, Nawabganj P.O., Cawnpore, U.P., India.
- 1900 Appleyard, George Henry, Khandalla, Cliff Road, Hornsea, E. Yorks.
- 1919 Appleyard, James Robert, Royal Technical Institute, Salford.
- 1916 Arbuthnot, Kenneth Charles Guthrie, B.A. (R.U.I.)
- 1888 *Archbutt, Leonard, The Yews, Madeley Street, Derby; and Chemical Laboratory, Midland Railway Company, Derby. [c. 1897-1900, 1902-05, 08-11, 13-16.]
- 1912 Archbutt, Sidney Leonard, 25, Bolton Gardens, Teddington, Middlesex.
- 1918 Ardern, Edward, D.Sc. (Manc.), Prior's Lee, Urmston, near Manchester.
- 1918 *Armstrong, Edward Frankland, D.Sc. (Lond.), Ph.D. (Berlin), F.C.G.I., Greenbank, Latchford, Warrington.
- 1905 *Arnaud, Francis William Frederick, Sessions House, Maidstone. [c. 1911-14.]
- 1917 Arup, Paul Seidelin, B.Sc. (Lond.), A.C.G.I., No. 4, Sunnyside, Devonshire Road, Liverpool.
- 1887 Ashby, Alfred, M.B. (Lond.), F.R.C.S. (Eng.), Ashdene, Argyle Road, Reading.
- 1909 Aston, Bernard Cracroft, Dominion Laboratory, P.O. Box 40, Wellington, New Zealand.

- 1903 *Aston, Stafford, 68, Stanhope Avenue, Church End, Finchley, London, N. 3.
- 1916 *Atack, Frederick William, B.Sc. (Lond.), M.Sc.Tech. D.Sc. (Manc.), A.M.S.T., The British Alizarine Co., Ltd., Trafford Park, Manchester.
- 1914 *Atkins, William Ringrose Gelston, O.B.E., M.A., Sc.D. (Dub.), The Laboratory, Citadel Hill, Plymouth.
- 1887 *Atkinson, Alexander John, Springcroft, Pentyrech, near Cardiff.
- 1878 *Atkinson, Robert William, B.Sc. (Lond.), 10, North Church Street, Cardiff.
- 1900 Auchinachie, Peter, Essex Villa, Tavistock Road, Woodford, Essex.
- 1888 *Audley, James Aloysius, B.Sc., A.R.C.S. (Lond.), 17, Gladstone Place, Hanley, Stoke-on-Trent.
- 1911 Auld, Samuel James Manson, O.B.E., M.C., D.Sc. (Lond.), Ph.D. (Würzburg), Meadhurst, Cadbury Road, Sunbury-on-Thames.
- 1912 Aumonier, Frederic Sutcliffe, B.Sc. (Lond.), The Little House, London Road, Harrow, Middlesex.
- 1904 *Austin, John Hilditch, Allscott, Wellington, Salop.
- 1918 *Austin, Percy Corlett, M.A. (Cantab.), D.Sc. (N.U.I.), Westminster Training College, 130, Horseferry Road, Westminster, London, S.W. 1.

B

- 1909 *Bacon, Rev. Geoffrey Noël, M.A. (Dun.), B.Sc., A.R.C.S. (Lond.), U.M.C.A., Likoma, Nyasaland.
- 1909 *Bacon, William, B.Sc. (Lond.), 27, Walbrook, London, E.C. 4. [c. 1919-.]
- 1903 Baguley, Allan, B.Sc. (Wales), Bellavista Road, Turffontein, Johannesburg, S. Africa.
- 1916 Bailey, Alan Milsom, 3, Grasmere Road, Muswell Hill, London, N. 10.
- 1909 Bailey, Harold James, O.B.E., Ingleside, Heath Park Avenue, Cardiff.
- 1893 Bailey, Thomas Lewis, Ph.D. (Heidelberg), Scotswood, 7, Lakeside Road, Palmers Green, London, N. 13.
- 1908 *Bain, Alexander William, B.A., B.Sc. (Lond.), Udney Place, Cromwell Road, Teddington, Middlesex.
- 1918 *Bain, Professor James Watson, B.A.Sc. (Toronto), The University, Toronto, Canada.
- 1919 *Baird, Will, 16, Kinnoull Mansions, Rowhill Road, Clapton, London, E. 5.
- 1888 Baker, Charles Kerslake, A.R.S.M., Prideaux Chambers, 16, Change Alley, Sheffield.
- 1912 Baker, Frederic Guy Stirling, O.B.E., M.A. (Oxon), Marryatt's Lodge, Snaresbrook, Essex.
- 1887 Baker, Harry, Beacon Field, Weston Road, Runcorn.
- 1897 Baker, Julian Levett, Dial Cottage, Cookham Road, Maidenhead. [c. 1907-09.]
- 1908 Baker, Thomas, D.Sc. (Dun.), 4, The Crescent, Doncaster Road, Rotherham.

- 1913 Ball, Walter Craven, Major, O.B.E., M.A. (Oxon), Sc.D. (T.C.D.), Experimental Station, Porton, Wilts.
- 1898 *Ballantyne, Horatio, 75, Chancery Lane, London, W.C. 2. [c. 1899–1900, 15 18; v.p. 1918, 1920–.]
- 1894 Ballard, Edward George, A.R.S.M., 8, Lansdowne House, Holland Park, London, W. 11.
- 1901 Baly, Professor Edward Charles Cyril, C.B.E., F.R.S., The University, Liverpool. [c. 1918–21.]
- 1903 Bamber, Montague Kelway, M.R.A.C., Government Agricultural Chemist, Colombo, Ceylon.
- 1914 Bannister, Charles Olden, A.R.S.M., Department of Metallurgy, The University, Liverpool. [c. 1917–19.]
- 1921 Barber, Charles Douglas, B.Sc. (Lond.), 20, Champion Road, Upminster, Essex.
- 1908 Barbour, William, M.A., B.Sc. (St. Andrews), Belmont, 43, Sorbie Road, Ardrossan, Ayrshire.
- 1896 *Bardsley, Joshua, Garrick Lodge, St. Paul's Avenue, Lytham, Lancs.
- 1907 Barke, Harold Frederick, Bristol and Western Counties Laboratory, 27, Berkeley Square, Clifton, Bristol.
- 1900 Barlow, Walter Harry, Arnside, Ryders Green Road, West Bromwich.
- 1899 Barlow, William, A.R.C.Sc.I., 23, Alton Terrace, Fairfield, near Manchester.
- 1900 Barnes, Charles Kepler, M.Sc. (Viet. and Liv.), A.R.C.Sc.I., 9, St. John's Road, Newport, Mon.
- 1888 *Barnes, Joseph, Highbrake, Arnside, Westmoreland.
- 1920 Barnett, Edward de Barry, B.Sc. (Lond.), 9, Collingham Road, South Kensington, London, S.W. 5.
- 1887 *Barnett, Robert William, 11, Exbury Road, Catford Hill, London, S.E. 6.
- 1892 *Barraclough, William Herbert, Westholme, Chapeltown, near Sheffield.
- 1908 Barrowcliff, Marmaduke, M.B.E., 20, Lansdowne Road, West Didsbury, Manchester.
- 1890 *Barry, Professor Thomas David Collis, c/o Messrs. Grindlay & Co., 54, Parliament Street, London, S.W. 1.
- 1883 *Bascombe, Frederick, 73, Tulse Hill, London, S.W. 2.
- 1914 Bassett, Captain Frank Laurence, B.Sc. (Lond.), Central Laboratory, Right Bank, Baghdad, Mesopotamia.
- 1906 *Bassett, Henry, D.Sc. (Lond.), Ph.D. (Munich), D. ès Sc. (Nancy), University College, Reading.
- 1897 *Bayley, Frederick Shelburne.
- 1904 Bayly, Harold Goodenough, c/o The Union Bank of Australia, Ltd., Pitt Street, Sydney, N.S.W.
- 1919 Bayly, Percival George Wykeham, Commonwealth Steel Products Works, Waratah, N.S.W., Australia.
- 1920 Beach, Frederick Frank, M.A. (Oxon), B.Sc. (Lond.), 36, Queen Square, Bristol.
- 1900 *Bean, Charles Edward, F.R.C.S. (Edin.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), L.S.A., 19, Lockyer Street, Plymouth.

- 1897 Beavis, Charles. Ph.D. (Würzburg), Naishcombe House, Wick, near Bristol.
- 1893 Beck, Charles Ridgeway, 53, Norroy Road, Putney, London, S.W. 15.
- 1917 Beckett, Ernest George, Ph.D. (Zurich), Gihnerton, Larbert, Stirlingshire.
- 1888 Beckett, George Henry, 90, Marlborough Avenue, Broomhill, Glasgow.
- 1917 Bedford, Sir Charles Henry, D.Sc., M.D. (Edin.), LL.D. (St. Andrews), The Burmah Oil Co., Ltd., 25, Great Winchester Street, London, E.C. 2.
- 1893 *Bedson, Professor Percy Phillips, M.A., D.Sc. (Dun.), D.Sc. (Lond.), B.Sc. (Viet.), Colwyn, Victoria Avenue, Sanderstead, Surrey. [c. 1895-98.]
- 1879 *Beilby, Sir George Thomas, D.Sc. (Dun.), Hon. LL.D. (Glas.), F.R.S., Department of Scientific and Industrial Research, 14/16, Old Queen Street, Westminster, London, S.W. 1. [c. 1899-1902; v.-p. 1902-05, 12-15; P. 1909-12; c. 1909-19.]
- 1895 *Bell, Albert Edward, 151, Camberwell Grove, London, S.E. 5.
- 1887 *Bell, Chichester Alexander, B.A., M.B. (Dub.), 28, Norham Road, Oxford.
- 1917 Bell, Marcus, O.B.E., Department of Defence, Melbourne, Australia.
- 1906 Benham, Keith Benham, B.Sc. (Lond.), Deans Hill, Stafford.
- 1909 *Bennett, Charles Thomas, B.Sc. (Lond.), 53, Ross Road, Wallington, Surrey.
- 1919 Bennett, George Macdonald, B.A., B.Sc. (Lond.), 94, Mercers Road, Tufnell Park, London, N. 19.
- 1910 Bennett, Reginald Robert, B.Sc. (Lond.), Barrister-at-Law, 22-30, Graham Street, City Road, London, N. 1.
- 1919 Benson, Richard Walters, Sunny Hill, Silcoates, near Wakefield.
- 1917 Bentz, Ernest, Westwoodside, Wilbraham Road, Manchester, S.W.
- 1916 Berry, Leslie Hamilton, B.Sc. (Lond.), Panguma, via Hangha, Sierra Leone.
- 1900 Berry, Reginald Arthur, Agric. Dip. (Cantab.), The West of Scotland Agricultural College, 6, Blythwood Square, Glasgow.
- 1918 Best, Thomas Thompson, Ph.D. (Erlangen), Woodleigh, Laurel Road, St. Helens.
- 1893 Bevan, Edward John, 4, New Court, Lincoln's Inn, London, W.C. 2. [c. 1894 97, 98-1901, 02-05, 11-14; v.-p. 1905-08, 14-17; c. 1917.]
- 1888 *Bevan, John Williams, Morriston Spelter Works, Morriston, R.S.O., Glam.
- 1878 *Bickerlike, William Edward, Bryers Croft, Wilpshire, near Blackburn.
- 1888 Biggart, John William, 29, Cathcart Street, Greenock.
- 1886 Billing, Henry Samuel, 42, Kingsley Road, Mutley, Plymouth.
- 1919 Binks, Frederick Nisbet, 18, Nixon Street, Lovaine Place, Newcastle-on-Tyne.
- 1912 Birch, William Colet, B.A. (Cantab.), The Chemical Laboratory, P.O. Box 141, Nairobi, British East Africa.
- 1906 Black, Walter Geoffrey, A.C.G.I., c/o Messrs. George Yaxley, Norwich, Ltd., Heigham Street, Norwich.

- 1919 Blackshaw, George Neville, O.B.E., B.Sc. (Wales), Government Laboratory, Department of Agriculture, Salisbury, Rhodesia.
- 1919 Blagden, John William, M.A. (Cantab.), Ph.D. (Würzburg), c/o Messrs. Howards & Sons, Ltd., Uphall Road, Ilford, Essex.
- 1909 Blair, Robert Westrup, A.R.C.Sc.I., Institute for Medical Research, Kuala Lumpur, Federated Malay States.
- 1892 Blake, Robert Frederick, Analytical Laboratory, Scottish Provident Buildings, Belfast. [c. 1914-17.]
- 1919 Bliss, Henry James Wheeler, B.A. (Oxon), M.A. (Columbia), Bond Place Chambers, Leeds.
- 1901 Bloch, Olaf Frederick Charret, 44, Finsbury Square, London, E.C. 2.
- 1895 Bloomer, Frederick John, Penpont, Clydach, Glam.
- 1891 *Bloxam, Arthur George, 30, Southampton Buildings, Chancery Lane, London, W.C. 2. [c. 1912-15.]
- 1909 Bloxam, Hugh Charles Loudon, c/o D. Lindsay, Esq., Royal Insurance Buildings, Calcutta, India.
- 1887 Blunt, Thomas Porter, M.A. (Oxon), Wyle Cop, Shrewsbury.
- 1899 Blyth, Meredith Wynter, B.A. (Cantab.), B.Sc. (Lond.), Lacton House, Tanbersley, near Barnsley.
- 1887 Bodmer, Richard, 16, Southwark Street, London, S.E. 1.
- 1918 Bolam, Herbert William, B.Sc. (Edin.), Ph.D. (Leipzig), Queen Margaret College, The University, Glasgow.
- 1887 Bolas, Thomas, 60, Grove Park Terrace, Chiswick, London, W. 4.
- 1897 Bolt, Frederick John, 6, Finsbury Square, London, E.C. 2.
- 1916 Bolton, Edward Richards, 6, Milner Street, London, S.W. 3.
- 1916 Boon, Professor Alfred Archibald, D.Sc. (Edin.), Chemistry Department, Heriot-Watt College, Edinburgh.
- 1903 *Booth, Norman Parr, Analytical Laboratory, Messrs. Cadbury Brothers, Limited, Bournville, near Birmingham.
- 1905 *Borland, William Dalrymple, Beacon Lodge, Bean, Dartford, Kent.
- 1887 *Bothamley, Charles Herbert, M.Sc. (Leeds), Weston-super-Mare.
- 1894 Bowes, Harry, 40, Radford Street, Blackley, Manchester.
- 1919 Bowis, William John, O.B.E., Ph.D. (Zurich), The Gables, Bridgford Road, West Bridgford, Notts.
- 1918 Bowles, Bertram Hennessey. Overdale, Eastwood Road, South Woodford, London, E. 18.
- 1898 Bowles, Horace Edgar, Laboratory and Assay Offices, Monument Chambers, King William Street, London, E.C. 4.
- 1918 Bowles, Percy Ewart, Ph.D. (Heid.), 36, Grosvenor Place, Jesmond, Newcastle-on-Tyne.
- 1917 Bowles, Thomas Henry, 43, Albion Road, Westcliff-on-Sea, Essex.
- 1888 *Bowman, Frederick Hungerford. Assoc.M.Inst.C.E., D.Sc., 76, Acomb Street, Whitworth Park, Manchester.
- 1894 *Boyce, Frank, 48, Duchy Road, Harrogate.
- 1918 Boyd, Alexander John, No. 8, Lancaster Court, Newman Street, Oxford Street, London, W. 1.

- 1904 Boyd, David Runciman, D.Sc. (Glas.), Ph.D. (Heid.), University College, Southampton.
- 1911 Boyd, James, A.R.T.C., P.O. Box 809, Johannesburg, Transvaal, South Africa.
- 1912 Boyd, Robert, B.Sc. (Glas.), c/o The British Columbia Sugar Refining Co., Ltd., Vancouver, B.C., Canada.
- 1918 Bracewell, Geoffrey Alfred, Newlands, Toller Lane, Bradford.
- 1916 *Brady, Oscar Lisle, B.A. (Cape of Good Hope), D.Sc. (Lond.), D.I.C., University of London Club, 21, Gower Street, London, W.C. 1. [c. 1918-21.]
- 1887 *Braithwaite, Arthur, Oakwell, Eaglescliffe Junction, Yarm.
- 1918 Brame, Professor John Samuel Strafford, 3, Vanbrugh Fields, Blackheath, London, S.E. 3.
- 1918 Bramley, Arthur, D.Sc., A.R.C.S. (Lond.), Technical College, Loughborough.
- 1920 Brannigan, Peter Joseph, D.Sc. (Q.U.B.), 61, Devonshire Street, Higher Broughton, Manchester.
- 1888 Branson, Frederick Woodward, Wynneholme, Far Headingley, Leeds.
- 1912 Brebner, John, M.A., B.Sc. (Aberd.), c/o Messrs. J. & J. Cunningham, Ltd., 44, Bernard Street, Leith.
- 1888 Brewis, Edward Theodore, 31, Belgrave Road, Leyton, Essex.
- 1914 Bridge, Stanley Wilkinson, B.Sc. (Lond.), c/o Messrs. Brandram Bros. & Co., Rotherhithe, London, S.E. 16.
- 1921 Briggs, John Frederick, A.C.G.I., 3, Hartington Street, Derby.
- 1887 *Briggs, Thomas Lynton, 188, Central Avenue, Flushing, Borough of Queens, New York, U.S.A.
- 1919 Brightman, Rainald, M.Sc. (Lond.), British Dyestuffs Corporation Ltd., Blackley, Manchester.
- 1907 Brincker, John Augustus Herman, B.A., M.B., B.C., D.P.H. (Cantab.), B.A. (Cape of Good Hope), M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.P.H. (R.C.P.S., Lond.), 262, Gloucester Terrace, Portchester Square, London, W. 2.
- 1908 Brisbane, James William, Bentcliffe, Bent Lane, Prestwich, Manchester.
- 1918 Brislee, Francis Joseph, D.Sc. (Liv.), Holmfield, Church Road, Roby, Lanes.
- 1885 *Broadbent, John James.
- 1919 Brook, George Bernard, The British Aluminium Co., Ltd., Kinlochleven, Argyllshire.
- 1907 Brooker, James William George, 8, Chisholm Road, Croydon, Surrey.
- 1900 Brooks, Cecil Joslin, c/o J. S. Brooks, Esq., Drinkstone, Bury St. Edmunds, Suffolk.
- 1889 *Brothers, Horace Edward, B.Sc. (Lond.), Clooney, Higher Knutsford Road, Latchford, Warrington.
- 1877 Brown, Professor Alexander Crum, M.A., M.D. (Edin.), D.Sc. (Lond.), Hon. LL.D. (Aberd. and St. Andrews), F.R.S., 8, Belgrave Crescent, Edinburgh. [v.-p. 1877-80, 82-84, 89-92, 98-1901.]
- 1905 *Brown, Arthur Edgcome, B.Sc. (Lond.), Laboratory, Plough Court, 37, Lombard Street, London, E.C. 3.

- 1913 Brown, Bernard Meredith, B.Sc. (Lond.), 8, Farquharson Road, West Croydon, Surrey.
- 1897 Brown, George Edward, c/o The British Journal of Photography, 24, Wellington Street, Strand, London, W.C. 2.
- 1917 Brown, Harold Bush, 35, Hawthorn Terrace, New Earswick, Yorks.
- 1887 Brown, Henry, Messrs. Benskin's Watford Brewery, Ltd., Watford, Herts.
- 1892 Brown, Henry Charles, Yoxford House, King's Lynn, Norfolk.
- 1877 Brown, Horace Tabberer, Hon. LL.D. (Edin.), F.R.S., 52, Nevers Square Kensington, London, S.W. 5. [c. 1888-91, 94 97, 1902-05.]
- 1908 Browne, Frank, 3, Freeland Road, Ealing, London, W. 5.
- 1919 Browning, Kendall Colin, M.A. (Cantab.), 11, Barton Terrace, Dawlish, S. Devon.
- 1919 Browning, Ronald George, B.Sc. (Lond.), Belswains, New Dover Road, Canterbury.
- 1921 Brownlee, George, B.Sc. (Edin.), Royal College of Science for Ireland, Dublin.
- 1918 Brownsdon, Henry Winder, M.Sc. (Vict.), Ph.D. (Jena), 43, St. Agnes Road, Moseley, Birmingham.
- 1895 Brownsword, Frank, M.Sc. (Vict.), Bryn Derwen School, Old Colwyn, North Wales.
- 1901 *Bruce, James, B.Sc., A.R.C.S. (Lond.), Ph.D. (Munich), The Technical College, Huddersfield.
- 1913 Bruce, Robert, M.C., 72, Blackford Avenue, Edinburgh.
- 1905 *Brünnich, John Christian, The Department of Agriculture, Brisbane, Queensland, Australia.
- 1900 Buchanan, John, Post Office, Odzi, Rhodesia, South Africa.
- 1878 Buchanan, John Young, M.A. (Cantab.), F.R.S., 26, Norfolk Street, Park Lane, London, W. 1.
- 1920 *Bullock, Edmund Rayner, B.Sc., A.R.C.S. (Lond.), 51, Clay Avenue, Rochester, N.Y., U.S.A.
- 1919 Bunker, Sidney Waterfield, D.S.O., M.C., B.Sc. (Lond.), Department of Technical Research, Province Wellesley, Straits Settlements.
- 1898 Burbridge, James Kerry, The Orchard, Philip Lane, South Tottenham, London, N. 15.
- 1918 Burford, Samuel Francis, The Ridgeway, Rothley, near Leicester.
- 1878 *Burge, Sir Charles Henry, J.P., Idlesleigh, Crescent Road, Kingston Hill, Surrey.
- 1889 *Burgess, William Thomas, 20, Priory Road, Bedford Park, London, W. 4. [c. 1914-17; v.p. 1917-20.]
- 1897 Burls, Frank Borrett, Laboratory, Custom House, London, E.C. 3.
- 1893 Burnham, John Charles, C.B.E., C.S.I., B.Sc. (Vict.), c/o Messrs. Grindlay & Co., 54, Parliament Street, London, S.W. 1.
- 1887 Burrell, Benjamin Arthur, 8, Springfield Mount, Leeds.
- 1898 Butcher, Herbert Thomas, A.R.S.M., c/o Messrs. Macdonald, Gibbs & Co., Capel House, 54, New Broad Street, London, E.C. 2.

- 1918 Butler, Gerald Snowden, B.A. (Oxon), Aruvankadu, Nilgiri Hills, S. India.
- 1918 *Butler, Thomas Howard, Ph.D. (Jena), M.Sc. (Bris.), c/o Messrs. Butler & Co. (Bristol), Ltd., Silverthorne Lane, St. Philip's, Bristol.
- 1896 *Butterfield, William John Atkinson, M.A. (Oxon), 66, Victoria Street, Westminster. London, S.W. 1. [c. 1909 12.]
- 1907 Byles, Denison Beuzeville, B.Sc. (Lond.), Fernbrook, 20, Wellington Road, Hampton Hill, Middlesex.
- 1908 Byrom, Thomas Henry, 15, Carlton Avenue, Kenton, Middlesex.
- 1906 Bywaters, Hubert William, D.Sc. (Lond. and Bristol), Ph.D. (Würzburg), A.R.C.S. (Lond.), 30, Henleaze Avenue, Bristol.

C

- 1910 Cahen, Edward, A.R.C.S. (Lond.), c/o The British Mining and Metal Co., Gunnislake, Tavistock.
- 1918 Caines, Charles March, 12, Sheldon Road, Cricklewood, London, N.W. 2.
- 1909 Caines, George Sidney Alfred, London County Council Chemical Department, 2, Savoy Hill, Strand, London, W.C. 2.
- 1908 Calam, Harold, B.Sc. (Vict.), M.Sc. (Leeds), 18, Melton Road, West Bridgford, Nottingham.
- 1917 Calder, William Alexander Skeen, Ravensthorpe, Harborne, Birmingham.
- 1908 Caldwell, Kenneth Somerville, B.Sc. (Wales), Ph.D. (Leipzig), Bankipur, E.I.R., Bengal. India.
- 1916 Caldwell, Professor William, M.A. (R.U.I.), M.A., Sc.D. (T.C.D.), Royal College of Surgeons in Ireland, Stephen's Green, Dublin.
- 1902 Caldwell, William Alfred, 2, Herriet Street, Pollokshields, Glasgow.
- 1904 Calvert, Harry Thornton, M.B.E., B.Sc. (Vict.), D.Sc. (Leeds), Ph.D. (Leipzig), Ministry of Health, Whitehall, London, S.W. 1.
- 1913 Cameron, Alec Munro, B.Sc. (Edin.), Chemical Laboratory, Beechleigh, Lasswade, Midlothian.
- 1918 Cameron, Alexander Thomas, M.A., B.Sc. (Edin.), Department of Physiology and Physiological Chemistry, University of Manitoba, Winnipeg, Canada.
- 1878 Cameron, James, 46, Onslow Gardens, Muswell Hill, London, N. 10. [c. 1902-05.]
- 1878 *Cammack, John, Fernsholme, Toll Bar, St. Helens, Lancs.
- 1918 Campbell, Andrew, The Coppice, Beckenham, Kent.
- 1918 *Campbell, Arthur Fred, M.Sc. (Manc.), Dyserth, Manchester New Road, Middleton, near Manchester.
- 1916 Campbell, Bertram, B.Sc. (Lond.), D.I.C., Glebelands, N. Farnborough, Hants.
- 1908 Campbell, John Alexander, c/o The British South African Explosives Co., Ltd., Modderfontein, Transvaal, South Africa.
- 1916 Campbell, Laurence Eversley, M.Sc. (Lond.), 5, St. Matthew's Avenue, Surbiton, Surrey.

- 1901 Campion, Professor Alfred, jun., Foundry Technical Institute, Falkirk.
- 1898 Candy, Hugh Charles Herbert, B.A., B.Sc. (Lond.), 6, Gordon Square, London, W.C. 1. [c. 1916-19.]
- 1915 *Cardwell, David, M.Sc. (Vict.), Dip. Chem. (Munich), 14, Blair Road, Alexander Park, Manchester, S.W.
- 1913 Carey, William Gordon, c/o Sunderland Water Co., 29, John Street, Sunderland.
- 1918 Carlos, Arthur Sidney, B.Sc. (Lond.), Fernlea, Freeland's Road, Bromley, Kent.
- 1917 Carmichael, John, 62, Norroy Road, Putney, London, S.W. 15.
- 1917 Carmichael, John Fisher, B.Sc. (Vict.), Tower Building, Liverpool.
- 1887 *Carmody, Professor Patrick, Rose Hill, Lostwithiel, Cornwall.
- 1911 Carpenter, Percy Henry, Assistant Scientific Officer, India Tea Association, Experiment Station, Jorhat, Cinnamara P.O., Sibsagar, Assam.
- 1899 Carr, Francis Howard, C.B.E., The British Drug Houses, Ltd., 22/30, Graham Street, City Road, London, N. 1. [c. 1909-12, 1919-.]
- 1907 Carter, Arthur Charles.
- 1910 Carter, Richard John, M.A. (Oxon), Royal Grammar School, Worcester.
- 1897 Carter, Walter Charles, c/o The Dominion Iron and Steel Co., Ltd., Sydney, Cape Breton, Nova Scotia.
- 1918 Cartwright, Thomas Turnel Frank, B.Sc., A.R.C.S. (Lond.), Factory Assistant Superintendent, Nicol Industrial Collodions, Ltd., Stowmarket, Suffolk.
- 1912 Carty, Ronald Devereux, A.R.C.Sc.I., 40, Cole Park Road, Twickenham, Surrey.
- 1913 Case, Alfred Edwin, B.Sc. (Lond.), 71, Gilloitt Road, Edgbaston, Birmingham.
- 1884 *Cassal, Colonel Charles Edward, V.D., Town Hall, Kensington, London, W. 8. [c. 1889-92, 93-96, 97-1900, 01-04, 05-08, 09-12; or 1892-93.]
- 1911 Caulkin, Howard Alfred, B.Sc. (Lond.), Invergarry, Sheepbrook Road, Solihull, near Birmingham.
- 1897 Caven, Robert Martin, D.Sc. (Lond.), Royal Technical College, Glasgow.
- 1914 Caw, William, c/o Ainsworth, 99, King Street, Cricff, Perthshire.
- 1913 *Challenger, Frederick, D.Sc. (Birm.), Ph.D. (Göttingen), B.Sc. (Lond.), Chemistry Department, The University, Manchester.
- 1910 Challinor, Richard Westman, Quidington, Emmerick Street, Leichhardt, New South Wales, Australia.
- 1898 Chambers, Thomas, Kiandra, Church Street, Waratah, Newcastle, New South Wales.
- 1917 Chance, Kenneth Macomb, M.A. (Cantab.), British Cyanides Co., Ltd., 49, Queen Victoria Street, London, E.C. 4.
- 1908 Chaplin, Edward Mitchell, Ph.D. (Würzburg), Public Analyst's Laboratory, Wakefield.
- 1893 Chapinan, Alfred Chaston, F.R.S., Laboratory, 8, Duke Street, Aldgate, London, E.C. 3. [c. 1903-06, 09-11, 1918-21; e. 1911-19; P. 1921-.]

- 1902 Chapman, Arthur Jenner, Baronsmere, 63, Stanhope Avenue, Church End, Finchley, London, N. 3. [c. 1921.]
- 1917 Chapman, Charles Eustace, Dept. of Chemistry, Adelaide, S. Australia.
- 1904 Chapman, Edgar Marsh, Llyn Ogwen, 65, Scalby Road, Scarborough.
- 1893 Charles, Rhys Pendrill, University of London Club, Gower Street, London, W.C. 1.
- 1899 *Chattaway, Frederick Daniel, M.A. (Oxon), D.Sc. (Lond.), Hon. B.Sc. (Birm.), Ph.D. (Munich), F.R.S., 151, Woodstock Road, Oxford. [c. 1900-3, 08-11; v.-p. 1903-05.]
- 1921 Cheke, Thomas William, Beacon Villas, Station Road, Marple, Cheshire.
- 1919 Cheng, Albert Pinzen, B.Sc. (Birm.), West Gate, Kiating-Ksien, Kiangsu, China.
- 1902 *Cheshire, Horace Fabian, B.Sc. (Lond.), Public Analyst's Laboratory, Hastings, Sussex.
- 1898 Chilwell, John, Messrs. Murray's, Ltd., Highlander Condensed Milk Faetory, Invercargill, N.Z.
- 1918 Christie, John, Yerton, Bowfield Road, West Kilbride, Ayrshire.
- 1918 Christie, John Hugh, B.Sc. (Lond.), c/o Dr. Bean, Crossgates, Leeds.
- 1911 Chrystall, Edwin Rodney, B.Sc. (Lond.), Forest Villa, Princes Road, Buckhurst Hill, Essex.
- 1913 Claremont, Claude Leopold Leszynski, B.Sc. (Lond.), 247, Kennington Road, London, S.E. 11.
- 1904 Clark, Robert Macfarlane, B.Sc. (Glas.), 138, Bath Street, Glasgow.
- 1902 Clark, William Bone, Larkfield, Earlestown, Lanes.
- 1920 Clarke, Arthur Leslie Rimmer, B.Sc. (Leeds), c/o Cia Mexicana de Petroleo El Aguila, S.A., La Refineria, Minatitlan, Ver., Mexico.
- 1905 Clarke, George, jun., Department of Land Records and Agriculture, Cawnpore, India.
- 1912 *Clarke, Hans Thacher, D.Sc. (Lond.), Kodak Park, Rochester, New York, U.S.A.
- 1907 Clarke, Reginald William Lane, B.Sc. (Lond.), 15, Torridon Road, Catford, London, S.E. 6.
- 1907 *Clarke, Robert William, Sanitary Commissioner's Office, Gibraltar.
- 1918 Clarke, Miss Rosalind, B.A. (R.U.I.), D.Sc. (N.U.I.), 4, St. Mary's Terrace, Galway.
- 1920 Clayton, Arthur, D.Sc., A.R.C.S. (Lond.), Oakwood, Kirkburton, near Huddersfield.
- 1920 Clayton, Ellis, 18, Merton Road, Bradford.
- 1902 Clayton, George Christopher, C.B.E., Ph.D. (Heidelberg), Croughton, near Chester.
- 1911 Clement, Leonard, M.A. (Cantab.), c/o Shell Marketing Co., Ltd., Shell Haven, near Stanford-le-Hope, Essex.
- 1920 Clewer, Hubert William Bentley, 13, Moyers Road, Leyton, London, E. 10.
- 1878 Clowes, Professor Frank, D.Sc. (Lond.), The Grange, College Road, Dulwich, London, S.E. 21. [c. 1888-91, 92-95, 97-1900; v.-p. 1900-03, 10-13; v. 1913-14.]

- 1915 *Coates, Mrs. Ada Maria, M.Sc. (Birm.), 5, Le Breos Avenue, Uplands, Swansea.
- 1917 *Coates, Joseph Edward, O.B.E., D.Sc. (Birm.), University College, Swansea. [e. 1919.]
- 1913 Cobb, Professor John William, C.B.E., B.Sc. (Lond. and Leeds), The University, Leeds.
- 1917 Cockburn, John Alexander, M.B.E., Ardeer Factory, Stevenston, Ayrshire.
- 1909 Cockburn, Thomas, 11, Grantly Gardens, Shawlands, Glasgow.
- 1918 Cocking, Thomas Tusting, c/o The British Drug Houses, Ltd., 22-30, Graham Street, City Road, London, N. 1.
- 1887 Coleman, Joseph Bernard, A.R.C.Sc.I., South Western Polytechnic, Chelsea, London, S.W. 3.
- 1918 *Coleman, Walter Henry, 1, Athole Gardens, Newlands, Glasgow.
- 1918 Colgate, Reginald Thomas, D.Sc. (Lond.), A.C.G.I., D.I.C., 25, Denmark Road, Reading.
- 1917 Collens, Archibald Edgar, The Government Laboratory, Antigua, B.W.I.
- 1913 Collett, Ronald Leslie, M.A. (Cantab.), 12, Hereford Mansions, Bayswater, London, S.W. 2.
- 1919 Colley, Alfred, Fairfield, Albert Road, Wolverhampton.
- 1897 Collie, Professor John Norman, Ph.D. (Würzburg), Hon. LL.D. (Glas.), F.R.S., University College, Gower Street, London, W.C. 1. [c. 1905-08; e. 1912-13.]
- 1901 Collingridge, Frank, B.Sc. (Lond.), Highstone, New Road, Llanelly, Carmarthenshire.
- 1917 Collins, Cecil George, 16, Granville Park, Lewisham, London, S.E. 13.
- 1908 Collins, Stanley Winter, B.Sc. (Lond.), 33, Oakhill Court, East Putney, London, S.W. 15.
- 1891 *Collins, Sydney Hoare, M.Sc. (Dun.), 9, Cavendish Place, Newcastle-on-Tyne.
- 1902 *Collis, Walter Thomas, 12, St. Peter's Road, Harborne, Birmingham.
- 1918 Collitt, Bernard, c/o Messrs. Rose & Laflamme, Ltd., 500, St. Paul Street, Montreal, Quebec.
- 1904 *Colman, Harold Govett, Ph.D. (Würzburg), M.Sc. (Vict.), 1, Arundel Street, Strand, London, W.C. 2. [c. 1908-11; e. 1915-21.]
- 1892 Colwell, James Kear, Finsbury Town Hall, Rosebery Avenue, London, E.C. 1. [c. 1900-03, 04-07.]
- 1904 Comber, Albert Walter, Laburnums, Forty Hill, Enfield, Middlesex.
- 1911 Connah, Frank Edwin, Government Chemical Laboratory, Brisbane, Queensland, Australia.
- 1894 Connah, James, B.Sc. (Lond.), Barrister-at-Law, Government Laboratory, Clement's Inn Passage, London, W.C. 2. [c. 1910-13.]
- 1902 Conroy, James Terence, B.Sc. (Lond.), Ph.D. (Göttingen), 9, The Serpentine, Grassendale, Liverpool.
- 1916 Conyers, Fred Gofton, The Bradford Wool Extracting Co., Ltd., Pit Lane Mills, Bradford.

- 1888 *Cook, Ernest Henry, D.Sc. (Lond.), Clifton Laboratory, 27, Berkeley Square, Bristol.
- 1898 *Cooksey, Thomas, B.Sc. (Lond.), Ph.D. (Marburg), Board of Health Office, Macquarie Street, Sydney, N.S.W.
- 1897 *Cooper, Arthur James, B.Sc. (Lond.), M.A., LL.D. (Dub.), Solihull School, Solihull, Birmingham.
- 1920 Cooper, Evelyn Ashley, D.Sc., A.R.C.S. (Lond.), The University, Edgbaston, Birmingham.
- 1918 *Cooper, Walter Johnson, The Elms, Lavernock, near Penarth, S. Wales.
- 1901 *Coppock, John Bridgeford, B.Sc. (Lond.), 34, Lee Lane, Horsforth, Leeds.
- 1919 *Corfield, Charles Edwin, B.Sc. (Lond.), 17, Bloomsbury Square, London, W.C. 1.
- 1896 *Coste, John Henry, London County Council Chemical Department, 2, Savoy Hill, Strand, London, W.C. 2. [c. 1908-11.]
- 1901 Cotterill, John William, Keble Lodge, Streetly, Sutton Coldfield.
- 1917 Cottrell, Allin, M.Sc. (Manc.), 3, Oxford Terrace, Edinburgh. [c. 1920 -.]
- 1920 Coulthard, Albert, B.Sc. (Vict.), Ph.D. (Freiburg), British Dyestuffs Corporation (Blackley), Ltd., Blackley, Manchester.
- 1911 Cowap, John Chester, B.Sc. (Vict.), The Government Analyst's Department, Penang, Straits Settlements.
- 1917 Coward, Hubert Frank, D.Sc. (Manc.), c/o Tootal Broadhurst Lee Co., 5, Oxford Street, Manchester.
- 1918 *Cowman, Douglas Henry Bellars, B.Sc. (Lond.), 2, Allison Gardens, Dulwich Common, London, S.E. 21.
- 1919 *Cox, Henry Edward, Ph.D. (Lond.), 44, Bassaleg Road, Newport, Mon.
- 1910 Coysh, Basil Radcliffe, Brooklyn Hants Co., Nova Scotia.
- 1910 Crabtree, James, M.Sc. (Vict.), British Guiana Sugar Planters Experiment Stations Committee, c/o Board of Agriculture, 19, Broad Street, Georgetown, British Guiana.
- 1916 Crabtree, John Ickeringill, M.Sc. (Vict.), Research Laboratory, The Eastman-Kodak Co., Kodak Park, Rochester, New York, U.S.A.
- 1898 *Craig, George, 95, Bath Street, Glasgow.
- 1917 Craig, Robert James, B.Sc. (Melbourne), Australian Fertilizers Prop., Ltd., Port Kembla, N.S.W., Australia.
- 1918 Crawford, John, 76, Forsyth Street, Greenock.
- 1888 *Cribb, Cecil Howard, B.Sc. (Lond.), 60, Greek Street, Soho, London, W. 1. [c. 1900-03, 06-7, 13-16, 17-20 ; e. 1907-11.]
- 1909 Crichton, David Cowan, M.A., B.Sc. (St. Andrews), Airybank, Cousland, Dalkeith.
- 1880 *Criper, William Risdon, A.R.S.M., Konnagar, Calcutta, India.
- 1888 Cripps, Richard Augustus, The Laboratory, D'Avigdor Road, Hove, Sussex.
- 1919 Croad, Robin Bruce, c/o Messrs. H. M. McArthur & Co., Ltd., 327/333, Vauxhall Road, Liverpool.

- 1919 Crocker, James Codrington, M.A. (Cantab.), D.Sc. (Lond.), 11, Lavengro Road, W. Norwood, London, S.E. 27.
- 1898 Cross, Charles Frederick, B.Sc. (Lond.), F.R.S., 4, New Court, Lincoln's Inn, London, W.C. 2. [c. 1914-17; v.-p. 1917-20.]
- 1899 *Crossley, Arthur William, C.M.G., C.B.E., D.Sc. (Vict.), Ph.D. (Würzburg), F.R.S., Shirley Institute, Didsbury, Manchester. [c. 1909-10; e. 1912-20.]
- 1902 Crossley, Watson, A.R.C.Sc.I., 2, St. Dunstan's Hill, Gt. Tower Street, London, E.C. 3.
- 1888 *Crowther, Horace Edward, Beeches Road, West Bromwich.
- 1918 Cruikshanks, George Shevas, Ph.D. (Leipzig), 16, Grantly Gardens, Shawlands, Glasgow.
- 1917 *Cumming, Alexander Charles, O.B.E., D.Sc. (Melbourne), Roselands, Crescent Road, Blundell Sands, Liverpool. [c. 1919-.]
- 1911 Cunningham, George Alexander Main, Glenview, Calder Road, Mossend, Glasgow.
- 1887 Curphey, William Salvador, 87, Canfield Gardens, South Hampstead, London, N.W. 6. [c. 1911-14.]

D

- 1893 *Dains, Herbert Henry, Marnock, 7, Mount View Road, Crouch Hill, London, N. 4.
- 1904 *Dakin, Henry Drysdale, B.Sc. (Vict.), Hon. D.Sc. (Yale), D.Sc. (Leeds), F.R.S., Edgehill, Ossington, R.F.D. 2, New York, U.S.A.
- 1910 *Dale, Hugh Gordon, c/o Sheffield Smelting Co., Ltd., Sheffield.
- 1908 Darling, Charles Robert, A.R.C.Sc.I., 34, Eglinton Hill, Plumstead, London, S.E. 18.
- 1878 *Darling, William Howarth, 49, Oxford Road, Altrincham, Cheshire.
- 1901 *Darnell-Smith, George Percy, B.Sc. (Lond. and Bris.), D.Sc. (Sydney), Department of Agriculture, Sydney, New South Wales.
- 1904 *Davidson, Alexander, St. Helens, Biggar, Lanarkshire.
- 1916 Davidson, Alexander Linton, 1065, Broadway West, Vancouver, B.C.
- 1882 Davidson, James, County Laboratory, Public Health Offices, County Buildings, Dumfries.
- 1918 *Davidson, John Howard, M.Sc. (Manc.), c/o Messrs. Wood Bros. Glass Co., Ltd., Borough Flint Glass Works, Barnsley, Yorks.
- 1900 *Davidson, William Brown, M.A., D.Sc. (Aberd.), Ph.D. (Würzburg), 12, Akenside Hill, Newcastle-on-Tyne.
- 1920 Davies, Daniel James, B.Sc. (Wales), Government Laboratory, St. John's, Newfoundland.
- 1914 Davies, Harold, 57, Oakhill Road, Putney, London, S.W. 15.
- 1894 Davies, Herbert Edward, M.A. (Cantab.), B.Sc. (Lond.), Laboratory, Chapel Chambers South, 28, Chapel Street, Liverpool.
- 1919 Davies, Joseph, Sunnyside, Mount Road, Upton, Birkenhead, Cheshire.
- 1897 *Davies, Percy Marr, A.R.C.Sc.I.

- 1919 Davies, Samuel Henry. M.Sc. (Vict.), Ryecroft, New Earswick, York.
- 1908 Davis, Bernard Furley, c/o The Assam Company, 5, Laurence Pountney Hill, London. E.C.4.
- 1915 Davis, Eric Gordon, B.Sc. (Lond.), 110, Ninth Avenue, West Roselle, N.J., U.S.A.
- 1907 Davis, Oliver Charles Minty, D.Sc., M.B., Ch.B. (Bristol), D.Sc. (Lond.), The University, Bristol.
- 1882 *Davis, Thomas H., 47, North 11th Street, Newark, N.J., U.S.A.
- 1914 Davis, William Charles, c/o The British Cyanides Co., Ltd., Pope's Lane, Oldbury, Worcestershire.
- 1911 Davson, Archibald Prideaux, A.R.C.S. (Lond.), 16, Airedale Road, Ealing, London, W. 5.
- 1898 Daw, Frederick Weldon, A.R.C.S. (Lond.), Highfield, Tredegar Road, Ebbw Vale, Mon.
- 1919 Dawson, Daniel Sutherland, B.Sc. (Aberd.), 12, Oakville Terrace, Leith.
- 1919 Dawson, William Haywood, Bracklyn, Stamford Road, Bowdon, Cheshire.
- 1921 Day, Frank Edward, B.Sc. (Lond.), 4, The Trossachs, North Strand, Limerick, Ireland.
- 1917 Deacon, Edgar Reginald, O.B.E., 178, Westmount Road, Eltham Park, London, S.E. 9.
- 1907 *Deane, Harold, B.Sc. (Lond.), c/o Messrs. Stafford Allen & Sons, Ltd., Long Melford, Suffolk.
- 1880 *Deering, William Henry, I.S.O., Glanmire, Bronshill Road, Torquay, Devon.
- 1902 *Denham, William Smith, D.Sc. (St. Andrews), B.Sc. (Lond.), 38, Priory Road, Bedford Park, London, W. 4.
- 1918 Denington, Richard Charles, 69, Dover Road, Wanstead Park, London, E. 12.
- 1904 *Denney, Edwin James, A.C.G.I., The White House, North Walsham, Norfolk.
- 1895 *Dent, Frankland, M.Sc. (Vict. and Leeds), Ph.D. (Munich), Government Analyst's Laboratory, Singapore, Straits Settlements.
- 1898 Desch, Professor Cecil Henry, Ph.D. (Würzburg), D.Sc. (Lond.), Faculty of Metallurgy, St. George's Square, Sheffield. [e. 1915-.]
- 1909 Desch, Mrs. Ellison Ann, 17, Collegiate Crest, Sheffield.
- 1902 *Dewar, Alexander Hugh, Linton, Mycenæ Road, Blackheath, London, S.E.
- 1878 *Dewar, Professor Sir James, M.A. (Cantab.), Hon. D.Sc. (Oxon, Dub., Vict., and R.U.I.), Hon. LL.D. (St. Andrews, Aberd., Edin., and Glas.), F.R.S., The Royal Institution, Albemarle Street, London, W. 1.
- 1904 Dewhirst, John Arthur, The Cottage, Burgh, near Ipswich.
- 1917 Dey, Biman Bihari, D.Sc. (Lond.), Presidency College, Calcutta, India.
- 1919 Dhar, Professor Nil Ratan, M.Sc. (Calcutta), D.Sc. (Lond.), D. és Sc. (Paris), Muir Central College, Allahabad, India.
- 1880 *Dibdin, William Joseph, 31, Idmiston Road, West Norwood, London, S.E. 27. [c. 1894-7, 1900-03.]

- 1918 Dick, James, jun., Cascade Inn, Shawinigan Falls, P.Q., Canada.
- 1904 Dick, William Douglas, c/o Miss Crichton, 5, Blythswood Drive, Glasgow, W.
- 1907 Dickinson, Cyril, B.Sc. (Vict. and Leeds), Public Analyst's Dept., Town Hall, Walworth Road, London, S.E. 17. [c. 1911-14.]
- 1911 Dickinson, Colonel William Henry, M.B., Ch.B. (Edin.) I.M.S., 14, Riding House Street, London, W. 1.
- 1913 *Dickson, William, Altcar, Bank Street, Irvine, Ayrshire.
- 1896 Dixon, Andrew James, Chemical and Assay Laboratory, Reiby Lane, Circular Quay, Sydney, N.S.W., Australia.
- 1920 Dixon, Professor Harold Baily, C.B.E., M.A. (Oxon), Hon. Ph.D. (Prague), F.R.S., The University, Manchester.
- 1921 Dixon, Stanley, M.Sc. (Sheff.), 300, Uttoxeter New Road, Derby.
- 1887 *Dobbie, Sir James Johnston, M.A., Hon. LL.D. (Glas.), D.Sc. (Edin.), F.R.S., Fairlie Cottage, Fairlie, Ayrshire. [c. 1903-06, 10-13; v.-p. 1914-15, 18-21; p. 1915-18; v. 1915-.]
- 1885 Dobbin, Leonard, Ph.D. (Würzburg), Chemical Laboratory, The University, Edinburgh.
- 1913 *Dodd, Alexander Scott, B.Sc. (Edin.), 20, Stafford Street, Edinburgh.
- 1898 *Dodd, Frederick Robertson, Welbank Villas, Liverpool Road, Aughton, Lanes.
- 1899 *Doherty, William Michael, The Government Laboratory, Health Department, Macquarie Street, Sydney, N.S.W., Australia.
- 1903 Don, John, M.A. (Aberd.), B.Sc. (Lond.), Gardenrose, Maybole, Ayr.
- 1900 *Donald, James Wallace, Kekahai, Kanai, Hawaii.
- 1888 Donald, Samuel, Tar Distillation Works, Carolina Port, Dundee.
- 1914 Donnan, Professor Frederick George, C.B.E., M.A. (Q.U.B.), Ph.D. (Leipzig), F.R.S., University College, Gower Street, London, W.C. 1. [c. 1915-19; c. 1918-20, 21-.]
- 1901 *Dootson, Frederick William, M.A. (Cantab.), D.Sc. (Dub.), Trinity Hall, Cambridge.
- 1919 Dorée, Charles, M.A. (Oxon), D.Sc. (Lond.), 103, Borough Road, London, S.E. 1.
- 1887 *Dott, David Brown, Ravenslea, Musselburgh.
- 1878 *Dougall, Samuel Shirra, Chemical Laboratory and Assay Office, Green's Chambers, 747, Hay Street, Perth, Western Australia.
- 1918 Douglas, John Robert, A.R.C.Sc.I., c/o Messrs. Nobel's Explosives Co., Ltd., Ardeer Factory, Stevenston, Ayrshire.
- 1892 *Douglas, William, Grafton House, Berkhamsted, Herts.
- 1921 Drakeley, Thomas James, M.Sc. (Lond.), 69, Rosebery Road, Muswell Hill, London, N. 10.
- 1892 Dreaper, William Porter, O.B.E., 27, Willow Road, Hampstead, London, N.W. 3. [c. 1911 14.]
- 1916 Drinkwater, Basil Walter, B.Sc., A.R.S.M., A.R.C.S. (Lond.), 66, Albert Palace Mansions, Battersea Park, London, S.W. 11.
- 1901 Drinkwater, Thomas William, L.R.C.P., L.R.C.S. (Edin.), Chemical Laboratory, Surgeons' Hall, Edinburgh. [c. 1921-.]

- 1919 Drummond, Jack Cecil, D.Sc. (Lond.), University College, Gower Street, London, W.C. 1.
- 1915 Duff, James Cooper, M.Sc. (Manc.), 13, Queen's Road, Erdington, Birmingham.
- 1888 *Duggan, Thomas Richard, 52, East 41st Street, New York City, N.Y. U.S.A.
- 1894 Duncan, Cecil Cooke, Shirehall, Worcester.
- 1918 Duncan, James Bothwell, B.Sc. (Dun.), 50, Hotspur Street, Tynemouth.
- 1918 Duncan, John Gibson, A.R.T.C., 67, Waverley Gardens, Crossmyloof, Glasgow.
- 1894 Duncan, William, The Laboratory, 65, Bath Row, Birmingham.
- 1901 *Dunn, John Thomas, D.Sc. (Dun.), 10, Dean Street, Newcastle-on-Tyne. [c. 1918-21.]
- 1918 Dunstan, Albert Ernest, D.Sc. (Lond.), Meadhurst, Sunbury-on-Thames.
- 1894 Dunstan, Malcolm James Rowley, O.B.E., M.A. (Oxon), South-Eastern Agricultural College, Wye, Kent.
- 1887 Dunstan, Professor Wyndham Rowland, C.M.G., Hon. M.A. (Oxon), Hon. LL.D. (Aberd.), F.R.S., Imperial Institute, South Kensington, London, S.W. 7. [c. 1889-92; e. 1892-96.]
- 1908 Dupré, Louis William, 4, Canton Road, Shanghai.
- 1908 Dupré, Percy Vivian, M.B.E., A.C.G.I., 2, Edinburgh Mansions, Howick Place, London, S.W. 1.
- 1917 *Durrans, Thomas Harold, M.Sc. (Lond.), 245, Woodstock Road, Oxford.
- 1914 Dyche-Teague, Francis Clifford, B.Sc. (Lond.), 258, Gloucester Terrace, Hyde Park, London, W. 2.
- 1880 *Dyer, Bernard, D.Sc. (Lond.), 17, Great Tower Street, London, E.C. 3. [c. 1889-92, 93-96, 97-99, 1903-06, 07-08; e. 1899-1903, 15-; v.-p. 1908-10; c. 1919-.]
- 1910 Dyke, Frederick Montague, B.Sc. (Lond.), Nelson Croft, 29, Chester Road, Lower Bebington, Cheshire.

E

- 1920 Eames, Robert Owen, B.Sc. (Wales), 16, Richmond Avenue, Fartown, Huddersfield.
- 1916 *Earl, John Campbell, B.Sc. (Adelaide), Ph.D. (St. Andrews), Department of Chemistry, Kintore Avenue, Adelaide, South Australia.
- 1918 Eastaugh, Frederick Alldis, A.R.S.M., The University, Sydney, Australia.
- 1916 *Eastburn, Gerald Jerome, Towerville, Helensburgh, Scotland.
- 1898 *Easterfield, Professor Thomas Hill, M.A. (Cantab.), Ph.D. (Würzburg), Director of the Cawthron Institute, Nelson, New Zealand.
- 1890 *Eastes, Ernest John, 16, Highland Road, Upper Norwood, London, S.E. 19.
- 1910 Eaton, Bertie James, O.B.E., Office of Director of Agriculture, Kuala Lumpur, Selangor, Federated Malay States.

- 1918 Edgar, Edward Charles, D.Sc. (Vict.), British Dyestuffs Corporation, Ltd., Huddersfield.
- 1903 Edmed, Frank George, O.B.E., A.R.C.S., B.Sc. (Lond.), Superintending Chemist, Admiralty Climatic Huts, R.N. Cordite Factory, Holton Heath, Dorset.
- 1916 Edon-Brown, Herbert, 1, Cartaret Street, London, S.W. 1.
- 1888 Edwards, Harry Leaton, The Shanty, Great Meols, Cheshire.
- 1896 Edwards, Vincent, 29, Kingsway, Mortlake, London, S.W. 14.
- 1897 *Edwards, Wilbraham Tollemache Arthur, M.R.A.C., 17, Ambrose Street, Rose Hill, Mauritius.
- 1919 Edwards, William Buckland, M.B.E., B.Sc. (Lond.), 1, Vanbrugh Park Road, Blackheath, London, S.E. 3.
- 1919 Egerton, Alfred Charles Glyn, B.Sc. (Lond.), 29, Wilton Crescent, London, S.W. 1.
- 1914 Eldridge, Arthur Alfred, B.Sc. (Lond.), A.K.C., 63, Ellerton Road, Surbiton Hill, Surrey.
- 1914 Elkington, Harold Douglas, M.Sc. (Lond.), St. Aubyns, Woodborough Road, Putney, London, S.W. 15.
- 1917 Elliot, Thomas Gifford, Hillcote, Park Edge, Hathersage, *via* Sheffield.
- 1914 *Elliott, Major Stanley, O.B.E., B.Sc. (Lond.), Hygiene Department, R.A.M. College, Millbank, London, S.W. 1.
- 1888 Ellis, Charles James, Almorah Villa, Milngavie, near Glasgow.
- 1902 Ellis, Charles Sordes, The Authors' Club, 2, Whitehall Court, London, S.W. 1.
- 1893 *Ellis, Er Victor, M.Sc. (Vict.), c/o McLellan, 31, Gayfield Square, Edinburgh.
- 1914 Ellis, Rowland Holliday, c/o Messrs. Price's Co., Ltd., Belvedere, Kent.
- 1892 *Ellwood, Thomas Asheroft, M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.P.H. (Cantab.), 99, Tollington Park, London, N. 4.
- 1906 Elsdon, Alfred Vincent, B.Sc. (Lond.), Chemical Department, Royal Arsenal, Woolwich, London, S.E. 18. [**c. 1921**-.]
- 1915 Elsdon, George Davidson, B.Sc. (Birm.), Municipal Chemical Laboratory, 141, Regent Road, Salford.
- 1901 Embrey, George, City and County Laboratory, 47, Park Road, Gloucester. [**c. 1915**.]
- 1918 Emmett, William Gidley, M.A. (Cantab.), Broadgate, Beeston, Notts.
- 1919 Emsley, Sydney, B.Sc. (Vict.), 26, Darwin Road, Southampton.
- 1902 *Entwistle, Albert Lucas, Royal Mint, Ottawa, Canada.
- 1905 Etheridge, Arthur Thomas, M.B.E., B.Sc. (Lond.), Research Department Royal Arsenal, Woolwich, London, S.E. 18.
- 1915 Evans, Bernard Scott, M.B.E., M.C., B.Sc. (Lond.), 1, Glenluce Road, Blackheath, London, S.E. 3.
- 1915 Evans, Edgar Charles, B.Sc. (Wales), Rhondda Research Laboratories, Llwynpia, Rhondda, Glam.
- 1914 Evans, Edward Victor, O.B.E., c/o The South Metropolitan Gas Co., 709, Old Kent Road, London, S.E. 15.
- 1914 Evans, Herbert John, B.Sc. (Wales), 1, Barkfield, Freshfield, Lanes.

- 1905 Evans, John, 67, Surrey Street, Sheffield.
- 1918 Everest, Arthur Ernest, D.Sc. (Birm.), Ph.D. (Bâle), Greystones, New North Road, Huddersfield.
- 1913 Evers, Norman, B.Sc. (Lond.), Messrs. Allen & Hanbury's, Ltd., Bethnal Green, London, E. 2.
- 1918 *Ewan, Thomas, M.Sc. (Vict.), Ph.D. (Munich), Richmond House, Dullatur.
- 1903 Eynon, Lewis, B.Sc. (Lond.), Fernleigh, Upminster, Essex. [c. 1920-.]
- 1920 Eyre, John Vargas, M.A., Ph.D. (Leipzig), The Linen Industry Research Association, The Research Institute, Lambeg, Belfast.

F

- 1917 Fagan, Bernard Goulding, B.A., B.Sc. (N.U.I.), A.R.C.Sc.I., City Laboratory, Chatham Row, Dublin.
- 1918 Fagan, Thomas Wallace, M.A. (Cantab.), Department of Agriculture, University College of Wales, Aberystwyth.
- 1921 Fairbourne, Arthur, B.A. (Oxon), M.Sc. (Manc.), 8, Victoria Road, Wittington, Manchester.
- 1916 Farmer, Robert Crosbie, O.B.E., D.Sc. (Liv.), Ph.D. (Würzburg), 83, Kingsfield Road, Bushey, Herts.
- 1888 Farrington, Thomas, M.A. (Q.U.I.), 4, Waterloo Place, Cork.
- 1921 Fearon, William Robert, M.A., Sc.D. (T.C.D.), F.T.C.D., The Physiological Laboratory, Trinity College, Dublin.
- 1877 *Fenton, Henry John Horstman, M.A., Sc.D. (Cantab.), F.R.S., 19, Brookside, Cambridge. [c. 1906-09.]
- 1918 *Ferguson, William Bates, K.C., M.A. (Oxon), 48, Compayne Gardens, London, N.W. 6.
- 1913 Ferrey, Cuthbert Edmund Caulfield, 41, Pinner Road, Harrow-on-the-Hill, Middlesex.
- 1892 Field, Charles Henry, The Laboratory, U.K. Works, Gosterwood Street, Deptford, London, S.E. 8.
- 1908 *Filmer, Reginald Mead, B.Sc. (Lond.), Royal Victoria Yard, Deptford, London, S.E. 8.
- 1913 Findlater, Richard Hamilton, c/o Government Analytical Laboratory, Cairo, Egypt.
- 1911 Findlay, Professor Alexander, M.A., D.Sc. (Aberd.), Ph.D. (Leipzig), Chemistry Department, The University, Marischal College, Aberdeen. [c. 1911-15; c. 1915-18, 19-.]
- 1898 Findlay, Hugh, Meltham Mills, Meltham, near Huddersfield.
- 1913 Finlow, Robert Steel, B.Sc. (Wales), Fibre Expert, Government of Bengal, Dacca, Bengal, India.
- 1917 Finn, Cornelius Philip, B.Sc. (Vict. and Leeds), Aronalia, Wath-upon-Dearne, near Rotherham.
- 1906 Finnemore, Horace, B.Sc. (Lond.), 33, The Waldrons, Croydon, Surrey.
- 1915 *Finney, Ada Maria, M.Sc. (Birm.), *see* Coates.
- 1892 Firby, Alfred Wood, 14, Harp Lane, London, E.C. 3.



- 1918 Fitch, Arthur James, 20, Empress Road, Derby.
- 1888 Fitz-Brown, George, A.R.S.M., Ditton Copper Works, Widnes.
- 1918 Fleck, Alexander, D.Sc. (Glas.), 26, Manor House Road, Jesmond, Newcastle-on-Tyne.
- 1892 Fletcher, Dugald George, Farm Cottage, Little Aiden, Kilereggan, Dumbartonshire.
- 1912 *Fletcher, Matthew Cunningham, c/o Dominion Cartridge Co., Ltd., Brownsburg, P.Q., Canada.
- 1919 Flint, John Walter, B.A. (Cantab.), 2, Wellington Road, Maidstone, Kent.
- 1905 Floris, Robert Brooke, 3, South Banks Terrace, Surbiton Hill, Surrey.
- 1918 Ford, John Simpson, 7, Corrennie Drive, Edinburgh.
- 1910 Foreman, Frederick William, M.A. (Cantab.), The Department of Agriculture, The University, Cambridge.
- 1902 Forster, Ferdinand Edward Paul, c/o Messrs. Bass, Ratcliff & Gretton, Ltd., 19, Guild Street, Burton-on-Trent.
- 1898 *Forster, Martin Onslow, D.Sc. (Lond.), Ph.D. (Würzburg), F.R.S., Queen Anne's Mansions, St. James's Park, London, S.W. 1. [c. 1905-08, 12-15; v.-p. 1908-11, 15-18; &c. 1918-19.]
- 1919 Forster, Robert Benjamin, A.R.C.Sc.I., Ph.D. (Berlin), D.Sc. (N.U.I.), Department of Colour Chemistry and Dyeing, The University, Leeds.
- 1920 *Fort, Morris, M.Sc. (Leeds), Cromwellpark Cottage, Almondbank, Perthshire.
- 1920 Foster, Henry Stennett, 109, Fitzwilliam Street, Huddersfield.
- 1900 Foster, John Alfred, East Riding of Yorkshire County Analyst's Offices, Chapel Lane, Hull. [c. 1910-13.]
- 1897 *Fowler, Professor Gilbert John, D.Sc. (Viet.), Indian Institute of Science, Hebbal, Bangalore, India. [c. 1910-14; c. 1914-16.]
- 1916 Fox, John Jacob, O.B.E., D.Sc. (Lond.), Government Laboratory, Clement's Inn Passage, London, W.C. 2.
- 1907 Francis, Arthur Gordon, B.Sc. (Lond.), Government Laboratory, Clement's Inn Passage, London, W.C. 2.
- 1906 Francis, Professor Francis Ernest, Ph.D. (Erlangen), D.Sc. (Viet.), Chemical Department, The University, Bristol.
- 1921 Francis, William, Science and Agriculture Department, Georgetown, Demerara.
- 1911 Frank, George Herbert, M.Sc. (Leeds), 18, Cleveland Road, Huddersfield.
- 1888 Frankland, Henry, Streonshalh, Linthorpe, Middlesbrough.
- 1884 *Frankland, Professor Percy Faraday, C.B.E., Hon. LL.D. (St. Andrews), Ph.D. (Würzburg), B.Sc. (Lond.), Hon. M.Sc. (Birm.), A.R.S.M., F.R.S., House of Letterawe, Loch Awe, Argyllshire. [c. 1888-91, 96-98, 1900-03; e. 1896-1900; v.-p. 1903-06, 09-12; P. 1906-09; &c. 1906-21.]
- 1908 Franklin, Arthur Cawte, The University, Hong Kong.
- 1908 Fraser, James Dick, 5, Millbrae Crescent, Langside, Glasgow.

- 1917 Frazer, Donald Richard, Maison Corenel, Garden City, Cairo.
- 1913 Freak, Gilbert Arthur, B.Sc. (Lond.), Hazeldene, Hillside Road, Bushey, Herts.
- 1919 Freeth, Francis Arthur, O.B.E., M.Sc. (Liv.), Heather Croft, Hartford, Cheshire. [c. 1921-]
- 1893 *French, William, M.A. (Cantab.), Heron Chemical and Colour Works, Lancaster.
- 1915 Friend, John Albert Newton, D.Sc. (Birm.), Ph.D. (Würzburg), Municipal Technical School, Birmingham.
- 1910 Frye, Colin Charlwood, O.B.E., Cape Explosives Works Co., Somerset West, South Africa.
- 1888 *Fryer, Alfred Cooper, Ph.D., M.A. (Leipzig), 13, Eaton Crescent, Clifton, Bristol.
- 1918 *Fryer, Percival John, Ravenscar, Tonbridge, Kent.
- 1904 Fyffe, William Alexander, Public Analyst's Laboratory, Stanley Mount, Douglas, Isle of Man.
- 1902 Fyleman, Martin Ernest, B.Sc. (Lond.), Ph.D. (Bâle), Kilmorna, Egmont Road, Sutton, Surrey.

G

- 1888 Gadd, Lieut.-Col. William Lawrence, V.D., 7, Lansdowne Square, Rosherville, Kent.
- 1905 Gall, John Beaconsfield, A.C.G.I., "Hasli Thal," 49, Glenlyon Road, Eltham Park, Kent.
- 1895 Gardner, John Addyman, M.A. (Oxon), St. George's Hospital, Hyde Park Corner, London, S.W. 7.
- 1913 Gardner, Walter Myers, M.Sc. (Leeds), 3, Fairmount, Bradford.
- 1918 Garland, Arthur Edward, M.B.E., B.Sc., A.R.C.S. (Lond.), Chemical Department, Royal Arsenal, Woolwich, London, S.E. 18.
- 1919 Garland, Charles Samuel, B.Sc., A.R.C.S. (Lond.), 103, Cannon Street, London, E.C. 4.
- 1905 Garle, John Longsdon, D.S.C., 1, Bolton Street, Piccadilly, London, W. 1.
- 1918 Garrett, Lieut.-Col. Frederic Charles, O.B.E., D.Sc. (Dun.), M.Sc. (Vict.), West Croft, Elvaston Road, Hexham, Northumberland.
- 1913 Garrett-Smith, Noel, c/o Messrs. Grindlay & Co., Calcutta, India.
- 1912 Garsed, William, Lindenhurst, Gresham Road, Staines, Middlesex.
- 1909 Garton, Sir Richard Charles, G.B.E., Lythe Hill, Haslemere, Surrey. [c. 1912-15.]
- 1909 Gates, Charles Gordon, B.Sc. (Lond.), 2, Cranbrook Road, Redland, Bristol.
- 1920 Gauge, Arthur Josiah Hoffmeister, 31, Hedge Lane, Palmers Green, London, N. 13.
- 1918 Gaul, Ernest George, M.Sc. (Manc.), The Chemical Department, The University, Manchester.
- 1912 Gawler, Robert, M.Sc. (Vict.), 76, Royal Park Avenue, Leeds.
- 1914 Gazdar, Miss Maud, B.Sc. (Lond.), Fox Hall, Upminster, Essex.

- 1888 Gemmell, George Harrison, The Chemical Laboratory, 4, Lindsay Place, Edinburgh.
- 1899 George, George, Director, Technical College, Auckland, New Zealand.
- 1920 Georgi, Charles Denis Victor, O.B.E., Department of Agriculture, Kuala Lumpur, Federated Malay States.
- 1892 Gerrans, Benjamin Henry, 57, Cricklade Avenue, Streatham Hill, London, S.W. 2.
- 1917 *Gibson, Charles Stanley, O.B.E., M.A. (Cantab.), B.Sc. (Oxon), M.Sc.Tech. (Manc.). The Chemical Department, Guy's Hospital, London, S.E. 1.
- 1921 Gibson, William Howieson, O.B.E., D.Sc. (Lond.), York Street Flax Spinning Co., Ltd., Belfast, Ireland.
- 1920 Gidden, William Thomas, A.C.G.I., Woodside, Abbey Road, Smethwick, near Birmingham.
- 1899 Gilbard, John Francis Hutchins, 245, Dalston Lane, Hackney, London, E. 8.
- 1890 *Giles, William Brantingham, The Grange, Leyton, Essex.
- 1915 *Gill, Harold Warren, B.Sc. (Lond.), Chief Resident Chemist, Magadi Soda Co., Magadi, British East Africa.
- 1902 Gilles, William Setten, A.C.G.I., The Cottage, Bocking, Braintree, Essex.
- 1917 *Gilling, Charles, B.Sc. (Lond.), 9, Alwyne Mansions, Wimbledon, London, S.W. 19.
- 1920 Gilmour, Hugh, 42, Trafalgar Road, Moseley, Birmingham.
- 1909 Gimingham, Conrad Theodore, O.B.E., Olympia Agricultural Co., Ltd., Research Department, The Bury, Offchurch, Leamington.
- 1900 *Glass, Thomas Waterworth, B.Sc. (Lond.), 4, Western Gardens, Ealing, London, W. 5.
- 1917 Glendinning, Tom Aldrich, M.Sc. (N.Z.), Watt Street, Highland Park, Wellington, New Zealand.
- 1920 Goddard, Ernest Donald, B.Sc. (Lond.), 14, Sharon Road, Chiswick, London, W. 4.
- 1910 Godden, William, B.Sc., A.R.C.S. (Lond.), The University, Leeds.
- 1899 Golding, John, D.S.O., University College, Reading.
- 1913 Goldsbrough, Harold Albert, Hodge Sherrieff Paper Co., Craven House, Kingsway, London, W.C. 2.
- 1917 Goldsmith, John Naish, M.Sc. (Manc.), Ph.D. (Heid.), 67, Chancery Lane, London, W.C. 2.
- 1914 *Goodban, Leonard, 43, Addison Gardens, Kensington, London, W. 14.
- 1908 Goodson, John Augustus, Wellcome Chemical Research Laboratory, 6, King Street, Snow Hill, London, E.C. 1.
- 1908 Goodwin, Henry Ward, The Mount, Red Hill, Arnold, Notts.
- 1907 Goodwin, Professor Leo Frank, Ph.D. (Heid.), A.C.G.I., Queen's University, Kingston, Ontario.
- 1878 Gordon, Joseph Gordon, Athenæum Club, Pall Mall, London, S.W. 1.
- 1902 *Goulding, Ernest, D.Sc. (Lond.), 88, Sylvan Avenue, Chitt's Hill, London, N. 22.

- 1888 *Gowland, Professor[†] William, A.R.S.M., F.R.S., 13, Russell Road, Kensington, London, W. 14. [c. 1897-99, 1905-08.]
- 1913 Grace, Claude Saville, B.Sc. (Lond.), 12a, Burlington Court, Grove Park, Chiswick, London, W. 4.
- 1908 Gracey, David Allan, Government Laboratory, Clement's Inn Passage, London, W.C. 2.
- 1882 *Graham, Christopher Colborne, M.B.E., Oriel House, Scarborough.
- 1897 Granger, James Darnell, Ph.D. (Berlin), 60, Waverdon Avenue, Chiswick, London, W. 4.
- 1893 *Grant, James, M.Sc. (Manc.), Oaklands, Gardner Road, Prestwich, near Manchester.
- 1904 *Gray, Archibald, Kirkland, Dalry, Ayrshire.
- 1890 *Gray, G. Watson, 8, Inner Temple, Dale Street, Liverpool. [c. 1919-.]
- 1907 Gray, James, P.O. Box 5254, Johannesburg, Transvaal, South Africa.
- 1918 Gray, James Ramsay, 25, Kidbrook Park Road, Blackheath, London, S.E. 3.
- 1888 *Gray, John, Spital Old Hall, Bromborough, Cheshire.
- 1916 *Gray, Professor Thomas, D.Sc. (Glas.), Ph.D. (Jena), Royal Technical College, Glasgow.
- 1918 *Greaves, Richard Henry, B.Sc. (Lond.), M.Sc. (Wales), Research Department, Royal Arsenal, Woolwich, London, S.E. 18.
- 1894 Greaves, William, 14, Wetherby Road, Roundhay, Leeds.
- 1887 *Green, Professor Arthur George, Hon. M.Sc. (Leeds), F.R.S., Holloway Clough, Arthog Road, Hale, Cheshire. [c. 1904-07.]
- 1888 *Green, John Edward, A.R.S.M., 195, Stretford Road, Urmston, Manchester.
- 1877 *Greenaway, Alfred John, The Orchard, Chertsey, Surrey. [c. 1892-95, 1902-05.]
- 1918 Greene, Stanley Gordon, Fairford, Penn Road, Beaconsfield, Bucks.
- 1883 *Greenish, Professor Henry George, 11, Grove Road, Willesden Green, London, N.W. 8. [c. 1906-09.]
- 1912 Greenough, Thomas Rigby, B.A. (Cantab.), Beechwood, Leigh, Lanes.
- 1878 *Greenway, Thomas John, 369, Collins Street, Melbourne, Victoria, Australia.
- 1917 Greenwood, Sidney Henry, 23, Grosvenor Road, Highbury, London, N. 5.
- 1914 *Greeves, Alfred, B.Sc., A.R.C.S. (Lond.), Wandsworth Technical Institute, Wandsworth, London, S.W. 18.
- 1907 Gregory, Joshua Craven, B.Sc. (Lond.), 3, Oak Villas, Bradford, Yorks.
- 1919 Grey, Egerton Charles, B.Sc. (Sydney), D.Sc. (Lond.), 6, Place Ste. Sulpice, Paris VI^{me}.
- 1910 *Grieb, Christopher Maurice Walter, B.Sc. (Lond.), The Mond Nickel Co., Clydach, S.O., near Swansea, Glam.
- 1919 Griffith, David Agnew, Silver Leigh, Poll Hill Road, Heswall, Cheshire.
- 1916 Griffiths, Richard Elliott, B.Sc. (Lond.), 10, Grafton Road, Acton, London, W. 3.
- 1900 Grimwood, Robert George, 14a, Graham Road, London, E. 8.

- 1916 Grinling, George Noel, The Chemical Laboratory, The Cocoa Works, York.
- 1918 Guthrie, Francis Clint, B.A. (Cantab.), Lyndhurst, Mossley Hill, Liverpool.
- 1900 *Guthrie, Frederick Bickell, Chemical Laboratory, Department of Agriculture, Sydney, N.S.W., Australia.
- 1904 *Guthrie, Tom, B.Sc. (Vict.), Ph.D. (Strassburg), c/o The Colonial Sugar Refining Co., Ltd., O'Connell Street, Sydney, N.S.W., Australia.
- 1919 Guthrie, William Alexander, O.B.E., c/o Government Analytical Laboratory, Cairo.

H

- 1914 Hackford, John Edward, B.Sc. (Lond.), 37, Mecklenburgh Square, London, W.C. 1.
- 1902 Hackman, Charles Adolphus, 325, Kennington Road, London, S.E. 11.
- 1912 Haddon, John William, B.Sc. (Vict.), Government Opium Factory, Singapore, Straits Settlements.
- 1916 *Hadfield, Sir Robert Abbott, Bart., Hon. D.Met. (Sheff.), Hon. D.Sc. (Leeds), F.R.S., 22, Carlton House Terrace, London, S.W. 1.
- 1888 *Hailes, Alfred James de, 15, Red Lion Square, London, W.C. 1.
- 1880 *Hake, Cecil Napier, The Oriental Club, Hanover Square, London, W. 1.
- 1878 *Hake, Henry Wilson, Ph.D. (Giessen), Westminster Hospital Medical School, Caxton Street, London, S.W. 1. [c. 1901-04.]
- 1915 Hale, Professor Arthur James, B.Sc. (Lond.), Finsbury Technical College, Leonard Street, City Road, London, E.C. 2.
- 1920 Hall, Archibald John, B.Sc. (Lond.), c/o Silver Springs Bleaching and Dyeing Co., Timbersbrook, Congleton, Cheshire.
- 1903 Hall, Harold, Chemical Laboratory, S.E. & C. Railway, Ashford, Kent.
- 1921 Hall, Horace Campbell, 7, Dairy House Road, Derby.
- 1898 Halliwell, Edward, Chief Inspector, c/o The Ribble Joint Committee, 2, Stanley Place, Preston, Lancs.
- 1908 Halpin, James Francis, St. Chad's, Benson Road, Forest Hill, London, S.E. 23.
- 1892 *Hambly, Frederick John, c/o The Electric Reduction Co., Ltd., Buckingham, Quebec, Canada.
- 1918 *Hamilton, David Douglas, A.R.T.C., "St. Catherine's," 31, Newlands Road, Newlands, Glasgow.
- 1918 Hamilton, Gavin, 18, Claremont Road, Rugby.
- 1918 Hamilton, James, 9, Esplanade Avenue, Whitley Bay, Northumberland.
- 1888 *Hamlet, William Mogford, Glendowan, Glenbrook, N.S.W., Australia.
- 1914 Hampshire, Charles Herbert, B.Sc. (Lond.), University College Hospital, Gower Street, London, W.C. 1.
- 1919 Hancock, Algie, 4, Ashburn Road, Heaton Norris, Stockport.
- 1899 Hancock, Walter Charles, B.A. (Cantab.), 10, Upper Chadwell Street, Myddelton Square, London, E.C. 1. [c. 1909-12.]

- 1901 Hanes, Edgar Septimus, 34, Sarre Road, West Hampstead, London, N.W. 2.
- 1901 Hanley, John, 7, University Road, Bootle, Liverpool. [c. 1921-.]
- 1902 Hannah, William Smith, Oak Lodge, Beddington Lane, near Croydon, Surrey.
- 1919 Hannay, James Ramsay, Know Mill House, Entwistle, near Bolton.
- 1906 Hanson, Edward Kenneth, M.A. (Cantab.), Woodthorpe, Royston Park Road, Hatch End, Middlesex.
- 1888 Harbord, Frank William, C.B.E., A.R.S.M., 16, Victoria Street, Westminster, London, S.W. 1. [e. 1907-11; c. 1911-14, 19-.]
- 1904 Harden, Arthur, D.Sc. (Vict.), Ph.D. (Erlangen), F.R.S., Sunnyholme, Bourne End, Bucks. [e. 1906-10, 1919-; c. 1913-16; v.-p. 1916-19.]
- 1918 Harding, Gilbert, 88, Telford Avenue, Streatham Hill, London, S.W. 2.
- 1898 Hardwick, William Roscoe, B.Sc. (Vict.), c/o Messrs. Huson and Hardwick, 13, Batavia Buildings, Hackin's Hey, Liverpool.
- 1888 Hargreaves, John, Widnes, Lanes.
- 1901 *Hargreaves, William Arthur, D.Sc., M.A., B.C.F. (Melbourne), Dept. of Chemistry, Kintore Avenue, Adelaide, South Australia.
- 1918 Harmsworth, Walter Pierpont, Chagford, Ruskin Road, Carshalton, Surrey.
- 1911 Harrington, Arthur George, 3, Westbury Road, Ealing, London, W. 5.
- 1906 Harris, Frederick William, 20, Trongate, Glasgow.
- 1908 *Harrison, Henry George, M.A. (Cantab.), 124, Pepys Road, New Cross, London, S.E. 14.
- 1901 Harrison, John Bristowe Pease, c/o Messrs. A. Boake, Roberts & Co., Ltd., Manufacturing Chemists, Stratford, London, E. 15.
- 1888 *Harrison, John Burchmore, C.M.G., M.A. (Cantab.), Government Laboratory, Georgetown, Demerara.
- 1917 Harrison, Thomas Weatherill, B.Sc. (Lond.), 18, Elfindale Road, Herne Hill, London, S.E. 24.
- 1918 Harrison, William, M.Sc. Tech. (Manc.), Beechwood, Walkden Road, Worsley, Manchester.
- 1887 Harrow, George Henry Unwin, Ph.D. (Würzburg), Messrs. Barclay, Perkins & Co., Ltd., Park Street, Southwark, London, S.E. 1.
- 1890 Hart, William Beamont, Manchester Laboratory, 8, Exchange Street, Manchester.
- 1900 *Hartley, Thomas, B.Sc. (Lond.), L.C.P., 64, Westlecot Road, Swindon, Wilts.
- 1902 *Hart-Smith, James, A.R.C.S. (Lond.), The Secondary School, Latchmere Road, Battersea, London, S.W. 11.
- 1919 Harvey, Harold Minter, c/o Messrs. Burgoyne, Burbidges & Co., High Street South, East Ham, London, E. 6.
- 1918 *Harvey, Thomas Featherstone, 5, Park Hill Road, Chingford, London, E. 4.
- 1897 Hatfield, John Adams, Messrs. Baldwins Ltd., Monmouthshire Branch, Panteg Sheet & Galvanizing Works, near Newport, Mon.

- 1900 Hawkins, Ernest Mostyn, Watling Chambers, Canterbury, Kent.
[c. 1917-20 ; v.-p. 1920 .]
- 1915 Hawley, Herbert, M.Sc. (Birm.), Public Health Department, 43, White Horse Street, Commercial Road, London, E. 1.
- 1917 Haworth, John, 31, Grove Road, Millhouses, Sheffield.
- 1911 Hawthorne, John, B.A. (R.U.I.), Ph.D. (Jena), 76, Scottish Temperance Buildings, 16, Donegall Square South, Belfast.
- 1918 Hay, James Gordon, Boswell House, Bolt Court, Fleet Street, London, E.C. 4.
- 1912 Hayman, Jack Vernon Johnson, A.C.G.I., The Government Analytical Laboratory, Public Works, Ministry Gardens, Cairo.
- 1920 Haythornthwaite, Alan, B.Sc., A.R.C.S. (Lond.), 79, West Side, Clapham Common, London, S.W. 4.
- 1913 Hayward, Eric, c/o Messrs. D. Waldie & Co., Chemical Works, Konnagar, Calcutta.
- 1910 Hayworth, William Prince, Langdale, Storeton Road, Prenton, near Birkenhead, Cheshire.
- 1891 Head, Casimir James, 26/29, Norfolk House, Laurence Pountney Hill, London, E.C. 4.
- 1911 Heap, Harri, M.Sc. (Manc.), "Brunside," Lyndhurst Road, Withington, Manchester.
- 1917 Heathcote, Henry Leonard, M.Sc. (Birm.), Harlech, Alderbrook Road, Solihull, Birmingham.
- 1917 Heaven, George Samuel, B.Sc. (Lond.), 9, Park Hill, Clapham, London, S.W. 4.
- 1895 Hefford, George Winfield, B.Sc. (Vict. and Leeds), 30, Salisbury Road, Moseley, Birmingham.
- 1878 *Hehner, Otto, 11, Billiter Square, London, E.C. 3. [c. 1884-85, 88-91, 92-93, 1908-11, 12-15 ; v.-p. 1893-95, 99-1902, 15-18 ; e. 1895-99 ; u. 1901-03.]
- 1911 Heilbron, Professor Isodore Morris, D.S.O., Ph.D. (Leipzig), The Chemistry Department, The University, Liverpool.
- 1889 *Hellon, Robert, Ph.D. (Heid.), A.R.S.M., 40, Lowther Street, Whitehaven.
- 1918 Hembrough, James, A.R.C.S. (Lond.), Principal, Newton Abbot Secondary School, Market Street, Newton Abbot, Devon.
- 1887 *Henderson, Professor George Gerald, M.A., D.Sc. (Glas.), Hon. LL.D. (St. Andrews), F.R.S., Chemistry Department, The University, Glasgow. [c. 1897-1900, 08-11, 16-19 ; e. 1904-08.]
- 1901 Henderson, John Brownlie, The Government Chemical Laboratory, Brisbane, Queensland, Australia.
- 1894 *Hendrick, Professor James, B.Sc. (Lond.), Agricultural Laboratory, The University, Aberdeen. [c. 1904-07.]
- 1908 Henley, The Hon. Francis Robert, M.A. (Oxon), 49, Montagu Square, London, W. 1.
- 1919 Henshaw, Samuel, Dimsdale House, Wolstanton, Staffs.
- 1917 Henstock, Herbert, M.Sc. (Vict.), Ph.D. (Zürich), Chemical Research Laboratory, School Gardens, Shrewsbury.

- 1913 Henville, Douglas, 40, Lowgate, Hull.
- 1918 Hepworth, Harry, B.Sc. (Lond.), Messrs. Nobel's Explosives Co., Ltd., Ardeer Factory, Stevenston, Ayrshire.
- 1918 Heriot, Thomas Hawkins Percy, Royal Technical College, Glasgow.
- 1877 *Herman, Douglas, Rainhill, Lanes. [c. 1877-82, 93-96.]
- 1887 *Herroun, Edward Felix, Ravenshaw, Croydon Road, Reigate, Surrey.
- 1904 Hewitt, Henry Dixon, c/o Messrs. Packards & James Fison (Thetford), Ltd., Thetford, Norfolk.
- 1918 Heycock, Charles Thomas, M.A. (Cantab.), F.R.S., King's College, Cambridge.
- 1914 Heywood, Alfred Douglas, 172, Heaton Moor Road, near Stockport.
- 1878 Hibbert, Walter, North Terrace, Gainford by Darlington.
- 1901 Higgin, Alfred James, The University, Melbourne, Victoria, Australia.
- 1909 Higgon, Mrs. Elsie Seville, B.Sc. (Lond.), 3, Berkeley Street, Cheltenham.
- 1921 *Higson, Geoffrey Isherwood, D.Sc. (Liv.), c/o The Institute of Chemistry.
- 1911 Hilditch, Thomas Percy, D.Sc. (Lond.), Birchdene, Cross Lane, Grappenhall, Cheshire.
- 1878 Hill, Alfred, M.D. (Aberd.), M.R.C.S. (Eng.), L.S.A. (Lond.), Valentine Mount, Freshwater Bay, Isle of Wight. [c. 1882-85.]
- 1879 *Hill, Professor Alfred Bostock, M.D. (Giessen), L.R.C.P., L.R.C.S. (Edin.), L.S.A. (Lond.), D.P.H. (Cantab.), Hon. M.Sc. (Birm.), Unity Buildings, Temple Street, Birmingham.
- 1899 *Hill, Charles Alexander, B.Sc. (Lond.), c/o The British Drug Houses, Ltd., 22-30, Graham Street, City Road, London, N. 1. [c. 1913-16, 20.]
- 1915 Hill, Edgar, A.R.C.S. (Lond.), 15, Blenkarne Road, Wandsworth Common, London, S.W. 11.
- 1899 Hill, Thomas Eustace, O.B.E., M.B., B.Sc. (Edin.), Shire Hall, Durham.
- 1908 Hills, James Stuart, Oxford Works, Tower Bridge Road, London, S.E. 1.
- 1917 Hinchley, Professor John William, A.R.C.S., 55, Redcliffe Road, London, S.W. 10.
- 1910 Hind, Herbert Lloyd, B.Sc. (Lond.), 11, Southwark Bridge Road, London, S.E. 1.
- 1907 Hinkel, Leonard Eric, M.Sc. (Lond.), A.K.C., Bucklands, Old Oak Road, Acton, London, W. 3.
- 1904 *Hinks, Edward, M.B.E., B.Sc. (Lond.), Analytical Laboratory, 16, Southwark Street, London, S.E. 1. [c. 1913-15.]
- 1902 Hinks, Percy John, O.B.E., A.R.C.S. (Lond.), Woodstock, Beaconsfield Road, Blackheath, London, S.E. 3.
- 1916 Hinton, Cyril Langley, Tyler's Cross, Roydon, Ware.
- 1919 Hirst, Henry Reginald, B.Sc. (Leeds), Riversdale, Collingham, near Leeds.
- 1912 Hoblyn, John Bright, A.R.C.S. (Lond.), Messrs. The Vauxhall Motors, Ltd., Luton, Beds.
- 1877 *Hodges, John Frederick William, Glenravel House, Glenravel, co. Antrim.

- 1883 *Hodgkin, John, 131, Hamlet Gardens Mansions, Ravenscourt Park, London, W. 6.
- 1878 Hodgkinson, Professor William Richard Eaton, C.B.E., Ph.D. (Würzburg), 89, Shooters Hill Road, Blackheath, London, S.E. 3. [e. 1880 82; c. 99 1902, 08-11, 14 17.]
- 1919 Hodgson, Herbert Henry, M.A. (Cantab.), Ph.D. (Heid.), B.Sc. (Lond.), 136, Paley Road, Bradford.
- 1910 Hodgson, Thomas Reginald, M.A. (Cantab.), 34, John Dalton Street, Manchester.
- 1918 Hodsman, Henry James, M.B.E., M.Sc. (Leeds), 2, Norwood Grove, Victoria Road, Headingley, Leeds.
- 1912 Hogan, George, Public Health Laboratories, Department of Public Health, Cairo, Egypt.
- 1888 *Hogben, Walter, 8, Coates Gardens, Edinburgh.
- 1911 Holborow, Alfred George, Sanitary Commissioners' Laboratories, Gibraltar.
- 1919 Holden, George Edward, M.Sc. Tech. (Manc.), 23, Durnford Street, Middleton, near Manchester.
- 1887 Holland, Philip, 22, Taviton Street, Gordon Square, London, W.C. 1.
- 1917 Holley, William Francis, 176, Westcombe Hill, Blackheath, London, S.E. 3.
- 1918 Hollingworth, David Vincent, Birchenwood Collieries, Kids Grove, Stoke-on-Trent.
- 1920 Holroyd, George William Fraser, M.A. (Oxon), Municipal Technical School, Blackburn, Lancs.
- 1918 Holt, Alfred, M.A. (Cantab.), D.Sc. (Manc.), The Rocklands, Thornton Hough, Cheshire.
- 1918 Homer, Miss Annie, D.Sc. (Dublin), Lister Institute of Preventive Medicine, Chelsea Gardens, London, S.W. 1.
- 1917 Honneyman, William, B.Sc., Chemical Laboratory, The York Street Flax Spinning Co. Ltd., Belfast.
- 1883 Hooker, Ayerst Henham, Norwegian Consulate, Cairo, Egypt.
- 1888 Hooper, David, LL.D. (Toronto), Seascope, Tor Church Road, Torquay.
- 1887 *Hooper, Egbert Grant, 16, Royal Avenue, Sloane Square, London, S.W. 1. [c. 1905-08; v.-p. 1908-11.]
- 1909 Hooper, Elsie Seville, B.Sc. (Lond.). See Higgon.
- 1908 Hooton, William Marrs, M.A. (Oxon.), M.Sc. (Liv.), Repton, Derby.
- 1887 Hopkins, Professor Frederick Gowland, D.Sc., M.B. (Lond.), M.A. (Cantab.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), F.R.S., Saxmeadham, Grange Road, Cambridge. [e. 1905-09, 14-; c. 1909-12.]
- 1918 Hopkins, Reginald Haydn, B.Sc. (Birm.), 21, Cluny Terrace, Edinburgh.
- 1919 Hopkins, Thomas, B.Sc. (Lond. and Wales), Glanwern, King George Avenue, Llanelly, S. Wales.
- 1918 Hopper, Isaac Vance, A.R.C.Sc.I., Chemistry Department, Royal Technical College, Glasgow.
- 1907 Hopwood, Arthur, A.R.C.S. (Lond.), D.Sc. (Manc.), Springfield, Northumberland Road, Carlisle.

- 1887 Hoskins, Arthur Percy, Clonlee, 14, Rosetta Park, Belfast.
- 1918 Houlder, Bertram Ernest, 50, Lady Margaret Road, Southall, Middlesex.
- 1910 Houseman, Percy Alfred, Ph.D. (Würzburg), c/o Messrs. The Macandrews & Forbes Co., Third Street and Jefferson Avenue, Camden, N.J., U.S.A.
- 1907 Howard, Bernard Farmborough, Firkbank, Loughton, Essex.
- 1878 *Howard, Thomas, 50, Ellington Street, Liverpool Road, London, N. 7.
- 1917 Hoyland, Francis William, c/o R. A. Cripps, Esq., F.I.C., The Laboratory, D'Avigdor Road, Hove, Sussex.
- 1904 Hübner, Julius, M.Sc. Tech. (Manc.), "Linden," Cheadle Hulme, Cheshire.
- 1899 Hudson-Cox, Frederiek, Analytical Laboratory, 87, St. Thomas's Street, Weymouth.
- 1888 Hughes, Theophilus Vaughan, A.R.S.M., Admont, Coed Coch Road, Colwyn, N. Wales.
- 1888 *Hughes, Thomas, 5, Dyfrig Street, Cathedral Road, Cardiff.
- 1916 Hulton, Henry Francis Everard, 15, Oakhill Court, East Putney, London, S.W. 15.
- 1888 Hunt, Bertram, c/o The Dorr Co., 16, South Street, London, E.C. 2.
- 1900 *Hunt, Philip Charles Holmes, M.Inst.C.E., 99, Queen Street, Melbourne, Victoria, Australia.
- 1894 Huntly, George Nevill, B.Sc., A.R.C.S. (Lond.), 28, Victoria Street, Westminster, London, S.W. 1. [e. 1915-21.]
- 1910 Hurst, Harry, B.Sc. (Lond.), Public Analyst and Bacteriologist, Manneville Chambers, Acresfield, Bolton, Lanes.
- 1882 Hutchinson, Thomas James, Aden House, Manchester Road, Bury.
- 1919 Hutchison, George Lewis, B.Sc. (Lond.), 72, Plum Lane, Plumstead, London, S.E. 18.
- 1877 Huxley, James Henry, A.R.S.M., 15, Kenwood Park Road, Sharrow, Sheffield.

I

- 1918 Ibbotson, Fred, B.Sc. (Lond.), F.R.C.Sc.I., 182, Springvale Road, Sheffield.
- 1918 Illingworth, Stewart Roy, A.R.C.S. (Lond.), School of Mines, Treforest, Glam.
- 1902 *Inrie, John, 212, Barnsley Road, Sheffield.
- 1920 Ingham, John William, B.Sc. (Lond.), Department of Chemistry, Heriot-Watt College, Edinburgh.
- 1894 Ingle, Harry, Ph.D. (Munich), B.Sc. (Vict.), D.Sc. (Leeds), 26, Bond Street, Leeds.
- 1888 *Ingle, Herbert, B.Sc. (Leeds), Cliff Cottage, Cliff Road, Headingley, Leeds.
- 1911 Inglis, John Kenneth Harold, M.A., B.Sc. (New Zealand), D.Sc. (Edin.), University of Otago, Dunedin, New Zealand.

- 1916 Innes, Alfred George, M.A. (Oxon), Ph.D. (Zürich), Deputy Director, Government Laboratory, Cairo.
- 1910 Innes, Robert Faraday, c/o Lister Institute, Chelsea Bridge, London, S.W. 1.
- 1900 *Innes, William Ross, Ph.D. (Heidelberg), D.Sc. (Vict.), 121, Norton Way, Letchworth, Herts.
- 1916 Isherwood, Percy Claude Cameron, O.B.E., Ph.D. (Würzburg), Moss Cottage, Bushey Heath, Herts.

J

- 1919 *Jackson, Ernest Wilfrid, Godrevy, Saltun-by-the-Sea, Yorks.
- 1887 Jackson, Sir Herbert, K.B.E., F.R.S., 49, Lansdowne Road, Holland Park Avenue, London, W. 11. [c. 1904-07, 16; v.-p. 1907-08. 16-18, 21; e. 1908 16; P. 1918-21.]
- 1901 Jackson, Percy George, 13, St. Clement's Road, Chorlton-cum-Hardy, Manchester.
- 1895 Jackson, Samuel, O.B.E., A.R.C.S. (Lond.), 3, Buckingham Gardens, Perambore Barracks, Madras, India.
- 1884 *Jago, William, Barrister-at-Law, 17, Wilbury Avenue, Hove, Sussex.
- 1910 *James, Benjamin Richards, Public Control Department, London County Council, Gloucester House, 19, Charing Cross Road, London, W.C. 2.
- 1907 James, Charles.
- 1918 James, Cuthbert William, M.Sc. (Wales), 34, Oak Road, Higher Crumpsall, Manchester.
- 1908 James, Garnet Williams, M.A. (Oxon.), c/o The Ioco Rubber and Waterproofing Co., Ltd., Netherton Works, Anniesland, Glasgow.
- 1918 James, Thomas Campbell, M.A. (Cantab.), D.Sc. (Wales), Val Solda, Caradoc Road, Aberystwyth, Wales.
- 1906 Jamieson, James Sprunt, The Government Laboratory, Johannesburg, Transvaal, South Africa.
- 1880 Jamieson, Thomas, 10, Belmont Street, Aberdeen.
- 1879 *Japp, Professor Francis Robert, M.A., Hon. LL.D. (St. Andrews), F.R.S., 36, Twyford Avenue, West Acton, London, W. 3. [c. 1885-89, 98-1901; v.-p. 1901-04.]
- 1913 Jaques, Arthur, D.Sc. (Dun.), 6, Southdown Road, Wimbledon, London, S.W. 19.
- 1887 Jarmay, Sir John G., K.B.E., Hartford Lodge, Hartford, Cheshire.
- 1919 Jenkins, Henry Charles, A.R.S.M., 815/17, Salisbury House, London, E.C. 2.
- 1905 Jenkins, John Edward, Highland Lodge, Fox Hill, Upper Norwood, London, S.E. 19.
- 1902 *Jenks, Robert Leonard, A.C.G.I., Chemical Examiner for Customs and Excise, 1, Charnock Place, Calcutta, India.
- 1894 Jennison, Francis Herbert, 14, Portland Terrace, Jesmond, Newcastle-on-Tyne.
- 1917 Jephcott, Harry, M.Sc. (Lond.), 121, Cambridge Gardens, London, W.10.

- 1907 Jewson, Frederick Trevor, Earith, near St. Ives, Hunts.
- 1883 Jobson, Thomas, Crucible Steel Company of America, Atha Works, Newark, N.J., U.S.A.
- 1888 Johnson, Alfred Edward, B.Sc. (London), A.R.C.Sc.I., 24, Parkdale, Wolverhampton.
- 1896 *Johnson, Edmond Ernest, Masecourt, Maidenhead, Berks.
- 1909 Johnson, Frederick Murray Godschall, Ph.D. (Breslau), M.Sc. (Montreal), Department of Chemistry and Mineralogy, McGill University, Montreal, Canada.
- 1912 Johnson, George Edward, B.Sc. (Lond.), Technical College, Park Street, Hull.
- 1919 Johnson, John William Haigh, B.Sc. (Vict.), M.Sc. (Leeds), Rivers Board, Wakefield.
- 1904 *Johnson, John Haslam, M.Sc. (Vict.), 1, Arundel Street, Strand, London, W.C. 2.
- 1917 Jones, David Trevor, M.Sc. (Vict.), 97, Argyle Road, Saltcoats, Ayrshire.
- 1888 Jones, Edward, B.Sc. (Lond.), Montclair Lodge, Foxgrove Road, Beckenham, Kent.
- 1917 Jones, Edward Towyn, M.Sc. (Wales), County School, Blaenau Festiniog, N. Wales.
- 1878 Jones, Edward William Taylor, 10, Victoria Street, Wolverhampton. [c. 1881-84, 93-94, 95-98, 1901-04.]
- 1907 Jones, Ernest Gabriel, M.Sc. (Vict. and Liv.), City Analyst's Department, City Laboratories, Mount Pleasant, Liverpool.
- 1905 *Jones, Ernest Victor, 2, Merridale Grove, Wolverhampton.
- 1902 *Jones, George Cecil, A.C.G.I., 43-45, Great Tower Street, London, E.C. 3.
- 1891 *Jones, Hedley Gordon, 32, Beech-hill Road, Eltham, Kent.
- 1880 *Jones, Henry Chapman, Birnam, 67, Shakespeare Road, Hanwell, London, W. 7. [c. 1896-99.]
- 1906 *Jones, Philip Henry, 7, James Street, Oxtou, Birkenhead.
- 1920 Jones, William Jacob, D.Sc. (Manc.), Chemistry Department, University College, Cardiff.
- 1919 Jordan, Louis Arnold, B.Sc., A.R.C.S. (Lond.), The Chestnuts, Brant-ham, Nr. Manningtree, Essex.
- 1916 *Joseph, Professor Alfred Francis, D.Sc., A.R.C.S. (Lond.), Government Chemist, Gordon College, Khartoum, Sudan.
- 1917 Joshua, Walter Philip, Ph.D. (Zürich), 42, Belsize Square, London, N.W. 3.
- 1911 *Joy, Arthur Stanley, A.R.C.S. (Lond.), Manor House School, Clapham Common, London, S.W. 4.
- 1902 *Joyce, Thomas Goode, B.Sc. (Lond.), Lyttleton Preserve Works, Brom-ford Lane, West Bromwich.
- 1906 Juritz, Charles Frederick, M.A., D.Sc. (Cape of Good Hope), D.Sc. (Adelaide), Agricultural Research Chemist, Department of Agriculture, Cape Town, South Africa.

K

- 1918 Kaye, John, M.A., B.Sc. (Glas.), Clifton Bank, Craigie, Perth.
- 1887 *Keane, Charles Alexander, Ph.D. (Erlangen), D.Sc. (Viet.), The Sir John Cass Technical Institute, Jewry Street, Aldgate, London, E.C. 3. [c. 1909-10.]
- 1917 Keith, Robert Philip, A.R.T.C. Shandon, Marlborough Park (Central), Belfast.
- 1878 Kellner, William, Ph.D. (Göttingen), 135, Victoria Road, Old Charlton, London, S.E. 7. [c. 1895-98.]
- 1878 *Kendall, James Alfred, Lonesome Chemical Works, Streatham Common, London, S.W. 16.
- 1902 Kendrew, Thomas, Broughton Copper Works, Salford, Manchester.
- 1917 Kent-Jones, Douglas William, B.Sc. (Lond.), c/o Messrs. Woodlands, Ltd., Granville Street, Dover.
- 1911 Kenyon, Joseph, D.Sc. (Lond.), Battersea Polytechnic, London, S.W. 11.
- 1906 Kerr, James Stewart, A.R.C.S. (Lond.), 19, Reservoir Road, Edgbaston, Birmingham.
- 1895 Kershaw, John Baker Cannington, Oaklands, Conway Road, Colwyn Bay, N. Wales.
- 1910 Kettle, James David, B.Sc. (Lond.), 17, Herndon Road, East Hill, Wandsworth, London, S.W. 18.
- 1918 *Kewley, James, M.A. (Cantab.), c/o The Asiatic Petroleum Co., St Helens Court, Gt. St. Helens, London, E.C. 3.
- 1920 Keys, William Harold, 1168, London Road, Alvaston, Derby.
- 1897 Kibble, William Oakes, c/o The Permutit Co., 440, Fourth Avenue, New York, U.S.A.
- 1910 King, Albert Theodore, B.Sc. (Lond.), Imperial College of Science and Technology, South Kensington, London, S.W. 7.
- 1907 King, Frank Eustace, B.Sc. (Lond.), 32, Brook Street, Holborn, London, E.C. 1.
- 1917 King, George, M.Sc. (Birm.), 25, Whitmore Road, Smallheath, Birmingham.
- 1916 King, James Grieve, Courtney House, 13, Humber Road, Blackheath, London, S.E. 3.
- 1877 Kingzett, Charles Thomas, Newlands, St. George's Avenue, Weybridge, Surrey. [c. 1877-82, 93-94.]
- 1905 Kinnersley, Henry Wulff, Lincoln College, Oxford.
- 1898 Kipping, Professor Frederic Stanley, D.Sc. (Lond.), Ph.D. (Munich), F.R.S., University College Nottingham. [c. 1899-1902.]
- 1897 *Kirkaldy, Patrick Henry, 5, New Court, Carey Street, London, W.C. 2. [c. 1916-19, 20-.]
- 1908 *Kirkham, Vincent Herbert, B.Sc. (Lond.), Agric. Dip. (Cantab.), Government Laboratory, Nairobi, British East Africa.
- 1906 Kirkhope, Thomas Bertram, Mayfield, West Kilbride, Ayrshire.
- 1888 Kitto, Benedict, Assay Office, 366, City Road, London, E.C. 1.
- 1888 Kling, Archibald, Court Lees, Warwick Park, Tunbridge Wells.

- 1919 Kloot, Alfred Aaron, B.Sc. (Lond.), London Chambers, Durban, Natal.
- 1915 *Knapman, Percy George, B.Sc. (Lond.), 17, Woodland Road, Chingford, Essex.
- 1906 Knapp, Arthur William, B.Sc. (Lond. and Birm.), Trinidad, Pineapple Road, King's Heath, Birmingham.
- 1888 Knecht, Professor Edmund, Ph.D. (Zürich), M.Sc. Tech. (Manc.), College of Technology, Manchester.
- 1888 Knight, Alfred Henry, Derrylin, Oxton, Cheshire [c. 1914-17.]
- 1912 Knight, Harley Fancutt, 14, Old Queen Street, Westminster, London, S.W. 1.
- 1913 Knight, Leslie, A.R.S.M., Assay Office, 51, Highfield Street, Liverpool.
- 1917 Knight, Reginald Sydney Gilbert, B.Sc., A.R.C.S. (Lond.), Royal Naval Cordite Factory, Holton Heath, near Wareham, Dorset.
- 1880 Knights, James West, 67, Tenison Road, Cambridge.
- 1920 Knowles, George Edward, 37, Malvern Road, Wallasey, Cheshire.
- 1915 *Krall, Hans, B.A. (Dub.), Agra College, Agra, India.

L

- 1908 Lacell, Harold George, A.R.C.S. (Lond.), Enderley, Lansdowne Road, Finchley, London, N. 3. [c. 1917-20.]
- 1911 Ladell, William Richard Simpson, Government Laboratory, Bangkok, Siam.
- 1917 Lambourne, Christopher, M.A. (Oxon.), 7, Tydraw Place, Cardiff.
- 1917 Lambourne, Herbert, B.A. (Cantab.), B.Sc. (Lond.), University College, Nottingham.
- 1920 Lampitt, Leslie Herbert, D.Sc. (Birm.), 33, Roxborough Park, Harrow-on-the-Hill, Middlesex.
- 1903 Lander, George Druce, D.Sc. (St. Andrews and Lond.), The Royal Veterinary College, Camden Town, London, N.W. 1.
- 1910 Lanc, Joseph Henry, B.Sc. (Lond.), 571, Commercial Road, London, E.1.
- 1903 Lang, Colonel William Robert, D.Sc. (Glas.), The University of Toronto, Department of Military Studies, Toronto, Canada.
- 1918 Lantsberry, Fred Charles Alfred Hyatt, M.Sc. Tech. (Manc.), 63, Walford Road, Sparkbrook, Birmingham.
- 1902 Lapworth, Professor Arthur, D.Sc. (Lond.), B.Sc. (Birm.), F.R.S., The University, Manchester. [c. 1916.]
- 1910 Lathwood, Arthur, B.Sc. (Lond.), 3, Maidstone Road, Bounds Green, London, N. 11.
- 1912 Lauder, Alexander, D.Sc. (Edin.), 13, George Square, Edinburgh. [c. 1916-19.]
- 1910 Law, Douglas John, B.Sc. (Lond.), Trent² Bridge Leather Works, Nottingham.
- 1894 *Law, Lieut.-Colonel Robert, Royal Mint, Melbourne, Victoria, Australia.
- 1921 Lawrence, Henry William, Chemical Laboratory, Johnsonville, Wellington, New Zealand.

- 1908 Laws, Harry Edwin, B.Sc. (Lond.), Chazalia, Park Avenue, Watford.
- 1887 Laws, Joseph Parry, Laurel Bank, Claremont Road, Headingley, Leeds.
- 1913 Leach, Frederick Peacock, D.Sc., A.R.C.S. (Lond.), Lyndon, Overton, Frodsham, Cheshire.
- 1890 Leather, John Walter, V.D., Ridgeway House, Ridgeway Cross, Nr. Malvern.
- 1919 Lee, John William, Birchill Lodge, Hasland, Chesterfield.
- 1921 *Lee, Theophilus Henry, Servigo Geologicae Mineralogicae de Brazil, Ministerio de Agricultura, Praia Vermelha, Rio de Janeiro, Brazil.
- 1878 *Leebody, Professor John Robinson, M.A., D.Sc. (R.U.I.), Magee College, Londonderry.
- 1918 Leech, Benjamin, M.A. (Cantab.), Beech Knoll, Macclesfield.
- 1912 Lees, Frederic Herbert, 31, Summerhill Road, Dartford, Kent. [1921 -]
- 1918 Legg, David Alliston, 17, Pepys Road, Raynes Park, London, S.W. 19.
- 1880 *Legg, John Edmund, M.A. (Cantab.), Cae Rhys, Dorchester Road, Weymouth.
- 1895 Leigh, Cecil, c/o Messrs. Thermit, Ltd., 155, Church Road, Battersea, London, S.W. 11.
- 1907 *Leighton, Arthur Edgar, Defence Department, Melbourne, Australia. [c. 1917.]
- 1916 Lennox, Robert Nicol, Grafton House, 42, Clarendon Road, Lewisham, London, S.E. 13.
- 1917 Leonard, Alfred Godfrey Gordon, F.R.C.Sc.I., B.Sc. (Lond.), Ph.D. (Bonn), 18, Belgrave Road, Rathmines, Dublin. [c. 1921].
- 1921 Le Rossignol, Robert, 7, St. John's Road, Harrow, Middlesex.
- 1893 Lester, Joseph Henry, M.Sc. (Viet.), Grange Drive, Monton Green, Eccles. [c. 1918-21.]
- 1917 Levinstein, Herbert, M.Sc. (Viet.), Ph.D. (Zürich), Birklea, Wilmslow Road, Didsbury, Manchester.
- 1911 Levy, Leonard Angelo, M.A. (Cantab.), D.Sc. (Lond.), 31, Shoot-up Hill, London, N.W. 2.
- 1918 Levy, Stanley Isaac, B.A. (Cantab.), B.Sc. (Lond.), c/o Sorbo Works, Woking.
- 1918 Lewin, Hugh James, Royal Clarence Yard, Gosport.
- 1909 Lewis, Samuel Judd, B.Sc. (Lond.), D.Sc. (Tübingen), Staple Inn Buildings, High Holborn, London, W.C. 1.
- 1903 Lewis, William Henry, M.A. (Oxon.), Albert Memorial College, Exeter.
- 1909 Lickorish, Adrian, Joseph Clifford, 28, Causton Road, Highgate, London, N. 6.
- 1897 Lilburne, John, Customs and Excise Laboratory, Custom House, Liverpool.
- 1912 Linch, Frank William, M.Sc. (Lond.), 36, Hermitage Road, Crumpsall, Manchester.
- 1888 Ling, Professor Arthur Robert, The University, Edmund Street, Birmingham. [c. 1906-09.]
- 1902 *Lishman, George Percy, D.Sc. (Edin.), The Lambton and Hetton Collieries, Ltd., Lambton Coke Works, Fence Houses, co. Durham.

- 1907 Littlebury, William Oswald, B.Sc. (Lond.), Woodville, Anderson Terrace, Ardrossan, Ayrshire.
- 1911 Littlefield, Robert Dexter, 1, Queen's Terrace, St. David's, Exeter.
- 1878 *Liveing, Professor George Downing, M.A. (Cantab.), Hon. Sc.D (Dub. and Cantab.), F.R.S., The Pightle, Cambridge.
- 1909 Liversedge, Samuel Gordon, Elmhurst, Chalkwell Park Drive, Leigh-on-Sea, Essex.
- 1892 *Liverseege, John Francis, City of Birmingham Analytical Department, 44, Broad Street, Birmingham.
- 1878 *Liversidge, Professor Archibald, M.A. (Cantab.), Hon. LL.D. (Glas.), A.R.S.M., F.R.S., Fieldhead, Coombe Warren, Kingston, Surrey.
- 1887 Livingston, William John, 30, Fountayne Road, Stoke Newington Common, London, N. 16.
- 1887 *Lloyd, Frederick James, 47, Fillebrook Road, Leytonstone, London, E. 11. [c. 1917-20.]
- 1905 Lloyd, John Alexander, Ph.D. (Würzburg), M.Sc. (Birm.), B.Sc. (Lond.), Brookside, Pridmore Road, Coventry.
- 1918 Lloyd, Lorenzo Lyddon, Ph.D. (Berne), Technical College, Bradford.
- 1909 Lloyd, Thomas Henry, c/o Messrs. Quibell Bros., Ltd., Newark.
- 1916 *Lodge, Edward, 33, Scale Hill, Cowcliffe, Huddersfield.
- 1895 Lones, Joseph, 41, Vicarage Road, Smethwick, Staffs.
- 1919 Longstaff, James Patrick, D.Sc. (Edin.), 6, Mansfield Road, Ilford, Essex.
- 1896 Lord, John Goodsir, M.A. (Oxon.), Merchant Taylors' School, Charterhouse Square, London, E.C. 1.
- 1880 Louis, Professor Henry, M.A. (Dun.), A.R.S.M., Armstrong College, Newcastle-on-Tyne.
- 1891 *Lowe, Clement Ward, Thorneyholme, Knutsford, Cheshire.
- 1914 Lowe, Harold, M.Sc. (Manc.), The Poplars, Park West, Heswall, Cheshire
- 1878 *Lowe, William Foulkes, A.R.S.M., Lochrie, Park West, Heswall, Birkenhead.
- 1919 *Lowry, Professor Thomas Martin, C.B.E., D.Sc. (Lond.), F.R.S., 54, Bateman Street, Cambridge.
- 1904 *Lowson, William, B.Sc. (Lond. and Leeds), The University, Leeds.
- 1906 *Lucas, Alfred, O.B.E., Government Analytical Laboratory and Assay Office, Cairo, Egypt.
- 1904 *Lucas, Edward William, C.B.E., Oxford Works, Tower Bridge Road, London, S.E. 1.
- 1918 Luck, Alfred Courtenay, 25, de Mayo, 611, Buenos Aires, Argentina.
- 1916 Lucking, Herbert Leslie, Ph.D. (Heid.), Hardwick, Garrick Avenue, Golders Green, London, N.W. 4.
- 1911 Luff, Bernard Dunstan Wilkinson, 85, Ashley Terrace, Edinburgh.
- 1918 Lumsden, Colin Henry, B.Sc. (Lond.), Beech Lawn, Whalley Range, Manchester.
- 1905 Lumsden, William Watt, 74, Caledonia Road, Saltcoats.
- 1908 *Lundholm, Carl Olof, 33, Beulah Hill, Upper Norwood, London, S.E. 19.

- 1895 *Luxmoore, Charles Mann, D.Sc. (Lond.), 49, Garden Avenue, Mitcham, Surrey.
- 1913 Lyell, Henry Robert, A.K.C., Redcott, Dueres Road, Forest Hill, London, S.E. 23.
- 1902 Lyle, Robert Ferris, 37, Robertson Street, Greenock.

M

- 1909 Macadam, Elison Ann, *see* Desch.
- 1892 Macadam, Stevenson John Charles George, Analytical Laboratory, 55, York Place, Edinburgh.
- 1904 *Macara, Thomas, 20, Denton Road, Stroud Green, London, N. 4.
- 1918 Macbeth, Alexander Killen, M.A., D.Sc. (Belfast), Chemical Department, The University, St. Andrews.
- 1888 MacCabe, William Bernard, M.Inst. C.E., Kismet, Clarence Point, West Tamar, Tasmania.
- 1918 MacCallum, Douglas Archibald, 93, Hope Street, Glasgow.
- 1917 MacDonald, George William, O.B.E., M.A., M.Sc. (Melbourne), 116, Belgrave Road, London, S.W. 1.
- 1894 MacDonald, William, A.R.C.S., A.R.S.M., Custom House, Samshui, Kwangtung, China.
- 1889 *Macfarlane, Principal Walter, County Technical College, Wednesbury.
- 1919 Macintyre, Ernest Gunn, B.Sc. (Glas.), El Aguila Refinery, Tampico, Mexico.
- 1888 *Mackey, William McDonnell, Victoria Chambers, South Parade, Leeds.
- 1918 MacLean, Mrs. Ida Smedley, D.Sc. (Lond.), 68, Overstrand Mansions, Battersea Park, London, S.W. 11.
- 1904 Macleod, James, Clairmont, 54, Albert Drive, Pollokshields, Glasgow. [c. 1921-].
- 1887 *Macnab, William, C.B.E., 10, Cromwell Crescent, London, S.W. 5. [c. 1893-96, 1907-10, 1913-16, 1918-21; v. p. 1921-.]
- 1918 MacWhirter, James, Elsinore, Milngavie, Dumbartonshire.
- 1897 Makin, Charles James Shaw, 47, Vineyard Hill, Wimbledon Park, London, S.W. 19.
- 1908 *Male, Charles Edgar, P.O. Box 141, Kobe, Japan.
- 1914 Mann, Edward Alexander, Government Analyst's Office, Wellington Street, Perth, Western Australia.
- 1913 Mann, Ernest William, B.Sc. (Lond.), Messrs. Southall Bros. & Barclay, Charford Chemical Works, Saltley, Birmingham.
- 1898 Mann, Harold Hart, D.Sc. (Leeds), M.Sc. (Viet.), Director of Agriculture, Bombay Presidency, Poona, India.
- 1911 *Mansfield, Herbert, B.Sc. (Lond.), 6, Aubrey Road, Crouch End, London, N. 8.
- 1912 Marcan, Alexander, The Government Laboratory, Bangkok, Siam.
- 1920 Mardles, Ernest Walter John, M.Sc. (Lond.), 16, Pinchurst Cottages, Farnborough, Hants.

- 1912 Marks, Arthur, A.R.C.S., A.R.S.M., Lindale, Knockdene, Belfast.
- 1913 *Marlow, George Stanley Withers, B.Sc. (Lond.), 37, Collingtree Road, Sydenham, London, S.E. 26. [Asst. Sec. 1919-.]
- 1891 *Marriott, Thomas Bruce, c/o The Century Trust, Ltd., 20, Copthall Avenue, London, E.C. 2.
- 1916 Marsden, Ernest, 38, Second Avenue, Copsewood Estate, Coventry.
- 1902 *Marshall, Arthur, A.C.G.I., Chemical Inspector, Indian Ordnance Dept., Kirkee, India.
- 1919 Marshall, Joseph, D.Sc. (Leeds), 11, George Road, West Bridgford, Notts.
- 1891 *Marshall, William, Laboratory, Ladybrook Road, Cheadle Hulme, near Stockport. [c. 1921-].
- 1913 Martin, Francis Grimshaw, B.Sc. (Birm.), 9, Cheltenham Avenue, Sefton Park, Liverpool.
- 1917 Martin, Geoffrey, D.Sc. (Lond. and Bris.), Ph.D. (Rostock), Co-operative Wholesale Society, Ltd., Research Dept., Insurance Buildings, 109, Corporation Street, Manchester.
- 1914 Mason, Harry Malkin, B.Sc. (Sheff.), 6, Grand Parade, Streatham Road, Mitcham, Surrey.
- 1918 Masson, Professor David Orme, C.B.E., M.A., D.Sc. (Edin.), F.R.S., The University, Melbourne, Australia.
- 1920 Masson, James Irvine Orme, M.B.E., D.Sc., (Melbourne), University College, Gower Street, London, W.C. 1.
- 1912 Masson, Robert Duncan, c/o Messrs. Anderson, Wright & Co., Calcutta, India.
- 1920 Mather, Ewart, B.Sc. (Lond.), Ruabon Chemical Works, Ruabon.
- 1880 *Mathew, William Edward Brisé de Vere, Dinham, Hillside Gardens, Wallington, Surrey.
- 1883 *Matthews, Charles George, 31, Stapenhill Road, Burton-on-Trent.
- 1911 Matthews, Charles Pask, B.A., B.Sc. (Lond.), Bourne Secondary School, Bourne, Lincs.
- 1919 Matthews, Donald John, Hydrographic Office, Admiralty, London, S.W. 1.
- 1887 Matthews, Francis Edward, Ph.D. (Göttingen), 107, Adelaide Road, Swiss Cottage, London, N.W. 3. [c. 1899-1902.]
- 1917 Maude, Aylmer Henry, The Cascade Inn, Shawinigan Falls, Quebec, Canada.
- 1910 Maudsley, Frank, B.Sc. (Vict.), 77, Woodgrove Road, Burnley.
- 1918 May, Percy, D.Sc. (Lond.), Organic Chemical Laboratory, South Parks Road, Oxford.
- 1919 McBain, James William, M.A. (Toronto), Ph.D. (Heid.), The University, Bristol.
- 1907 McCall, Thomas, The Government Chemical Laboratory, Brisbane, Queensland, Australia.
- 1918 McCandlish, David, 22, Ayresome Avenue, Roundhay, Leeds.
- 1906 McCombie, Hamilton, D.S.O., M.C., M.A. (Aberd. and Cantab.), A.R.C.S. B.Sc. (Lond.), Ph.D. (Strassburg), B.Sc. (Birm.), King's College, Cambridge.


- 1906 McCrae, John, Ph.D. (Heid.), The Government Laboratories, P.O. Box 1080, Johannesburg, Transvaal, South Africa.
- 1894 McCubbin, William Alexander, Meeson House, Meeson, Wellington, Shropshire.
- 1918 McDavid, James Wallace, M.Sc. (Vict.), D.Sc. (Edin.), Hartford, South Beach Road, Ardrossan, Ayrshire.
- 1915 McDonald, Donald, B.Sc. (Lond.), 80, Hatton Garden, London, E.C. 1.
- 1920 McEwan, Thomas Lawson, B.Sc. (St. Andrews), 22, Kinveachy Gardens, Charlton, London, S.E.
- 1881 *McGowan, George, Ph.D. (Leipzig), 21, Montpelier Road, Ealing, London, W. 5. [c. 1908-11; v.p. 1911-14; c. 1914-15.]
- 1917 *McHugo, Christopher William, 35, Warrior Square, Southend-on-Sea.
- 1916 McKenzie, Professor Alexander, M.A., D.Sc., (St. Andrews), Ph.D. (Berlin), F.R.S., University College, Dundee.
- 1905 McLellan, Basil Gordon, c/o Messrs. Rowntree & Co., Ltd., The Cocoa Works, York.
- 1902 McMullan, Charles, 7, William Street, South Belfast.
- 1915 McRae, John Alexander, M.A. (Queen's), Ph.D. (Manc.), Toronto), Queen's University, Kingston, Ontario.
- 1887 *Meanwell, Charles Wright, 7, Muswell Hill Road, London, N. 10.
- 1901 Meggitt, Loxley, 12, Teakle Street, Summer Hill, Sydney, N.S.W., Australia.
- 1895 Melland, Godfrey, M.Sc. (Vict.), A.R.S.M., The Chemical Department, The Polytechnic, Woolwich, London, S.E. 18.
- 1904 Melling, Samuel Ernest, Bank House, The Cliff, Higher Broughton, Manchester. [c. 1920-].
- 1888 Mellon, William Warnock, Woodlands, Avoca Avenue, Blackrock, co. Dublin.
- 1920 Melville, Archibald Carswell, 50, Perth Road, Ilford, Essex.
- 1892 Mercer, Thomas, 32, Gwydyr Mansions, Hove, Sussex.
- 1905 Merrett, William Henry, A.R.S.M., Hatherley, Grosvenor Road, Wallington, Surrey.
- 1909 Merritt, Ewart Herbert, B.Sc. (Lond.), Coten Lodge, Warwick.
- 1917 Methley, Bernard Willoughby, Ferndale, Moorgate, Rotherham, Yorks.
- 1918 Michie, Arthur Cumming, D.Sc. (Aberd.), 12, Akenside Hill, Newcastle-on-Tyne.
- 1907 Micklethwait, Miss Frances Mary Gore, M.B.E., A.R.C.S. (Lond.), The Horticultural College, Swanley, Kent.
- 1880 Midwinter, Edward James Henry, Lic. Faculty of Phys. and Surgs. (Glas.), L.S.A. (Lond.), 187, Gleneldon Road, Streatham, London, S.W. 16.
- 1900 Millar, James Hill, D.Sc. (Birm.), St. James's Gate Brewery, Dublin.
- 1887 *Miller, Alexander Kenneth, Ph.D. (Würzburg), The Laboratory, 325, City Road, Manchester.
- 1911 *Miller, Lieut.-Colonel Alfred, M.B. (Lond.), L.R.C.P., M.R.C.S. (Eng.), 22, Madeley Road, Ealing, London, W. 5.

- 1897 Miller, James, 53, Newlands Road, Glasgow.
- 1910 Miller, James, 12, Dalveen Avenue, Davyhulme, Nr. Manchester.
- 1918 Miller, James McPherson, M.Sc. (Manc.),
- 1918 Millin, David, B.A. (Cape of Good Hope), P.O. Box 3415, Johannesburg, Transvaal, S. Africa.
- 1917 Millington, John Price, M.B.E., M.A. (Cantab.), B.Sc. (Wales), 18, Cadogan Court, London, S.W. 3.
- 1903 Mills, Charles, L.D.S. (Eng.), A.C.G.I., Post Office, Box 112, Kroonstad, O.F.S., South Africa.
- 1918 Mills, William Sloan, M.A., D.Sc. (R.U.I.), Messrs. Levinstein, Ltd., Ellesmere Port, near Chester.
- 1900 Mingaye, John Charles Henderson, Chemical Laboratory, Department of Mines and Agriculture, Sydney, N.S.W., Australia.
- 1901 *Mitchell, Albert Henry, B.Sc. (Lond.), Borough Analyst's Laboratory, Hensleigh Road, Tiverton, Devon.
- 1897 Mitchell, Charles Ainsworth, M.A. (Oxon.), c/o Messrs. Beaufoy & Co., 87, South Lambeth Road, London, S.W. 8.
- 1918 Mocatta, Miss Ethel Grace, B.Sc. (Lond.), *see* Theomin.
- 1916 Moir, James, M.A., D.Sc. (Aberd.), 48, Ditton Avenue, Auckland Park, Johannesburg.
- 1909 Monier-Williams, Gordon Wickham, O.B.E., M.C., M.A. (Oxon.), Ph.D. (Freiburg), Lower Farm, Stoke D'Abernon, Surrey. [c. 1912-15, 20-.]
- 1919 Moodie, William Ewing, Avenue Cottage, Alexandria, Scotland.
- 1888 Moody, Gerald Tattersall, D.Sc. (Lond.), 104, Dashwood House, London, E.C. 2.
- 1898 *Moor, Cresacre George, M.A. (Cantab.), 30, Great James Street, Bedford Row, London, W.C. 1.
- 1918 Moore, Charles Watson, M.Sc. (Manc.), Ph.D. (Munich), D.Sc. (Vict.), Grappenhall Cottage, Grappenhall, Cheshire.
- 1917 Moore, Harold, O.B.E., B.Sc. (Lond.), Lindsey House, Lloyd's Place, Blackheath, London, S.E. 3. [c. 1921-.]
- 1902 Moore, William, c/o Messrs. Grindlay & Co., Bombay,
- 1916 More, Andrew, A.R.C.S. (Lond.), Ellesmere, King's Road, Walton-on-Thames. [c. 1919-.]
- 1901 *Morgan, Professor Gilbert Thomas, O.B.E., D.Sc., A.R.C.S. (Lond.), F.R.S., The University, University Road, Edgbaston, Birmingham. [c. 1916-19; v.-p. 1919-.]
- 1900 Morgan, John James, "Lyndhurst," Western Road, Flixton, Lanes.
- 1888 Moritz, Edward Ralph. Ph.D. (Göttingen), 45, Great Tower Street, London, E.C. 3.
- 1887 *Morley, Henry Forster, M.A., D.Sc. (Lond.), 5, Lyndhurst Road, Hampstead, London, N.W. 3. [c. 1892-95.]
- 1914 Morrell, George Francis, Ph.D. (Kiel), B.Sc. (Lond.), 23, Finchley Way, Finchley, London, N. 3.
- 1917 *Morrell, Robert Selby, M.A. (Cantab.), Ph.D. (Würzburg), Tor Lodge, Tettenhall Wood, Wolverhampton.

- 1915 *Morris, Robert Leitch, 27, Wilbury Villas, Hove, Sussex.
- 1915 Moss, Henry Webster, A.R.C.Sc.I., British Dyes, Ltd., Huddersfield, Yorks.
- 1880 *Moss, Richard Jackson, St. Aubyn's, Ballybrack, co. Dublin.
- 1918 Mott, Owen Edwin, O.B.E., Ph.D. (Heid.), Meadhurst, Sunbury-on-Thames.
- 1888 Moul, Frank, Aldersgate Chemical Works, Southall, Middlesex.
- 1896 Mousley, Frank, A.R.S.M., Burns Bay Road, Longueville, Sydney, N.S.W., Australia.
- 1909 Mummery, William Rest, Chemical Laboratory, Johnsonville, Wellington, New Zealand.
- 1888 *Munro, John May Herbert, D.Sc. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), 12, Grosvenor Place, Bath.
- 1911 Murphy, Major Paul, Officer i/c Chemistry and Anti-Gas Department, R.E. Experimental Station, Porton, Wilts.
- 1919 Murray, Thomas Jenkins, Ph.D. (Leipzig), M.Sc. (Birm.), Municipal Technical School, Wolverhampton.
- 1878 Muspratt, Edmund Knowles, Hon. LL.D. (Liv.), 5, Windsor Buildings, George Street, Liverpool. [c. 1897-98.]
- 1899 Muter, Alexander Henry Mitchell, 325, Kennington Road, London, S.E. 11.
- 1920 Myers, John, 23, Dewsland Park Road, Newport, Mon.

N

- 1915 Nag, Professor Nagendra Chandra, M.A. (Calcutta), Bose Institute, 93, Upper Circular Road, Calcutta, India.
- 1921 Naik, Professor Kuverji Gosai, M.A., B.Sc. (Bombay), The College, Baroda, India.
- 1917 Napper, Sidney Scrivener, A.C.G.I., c/o Messrs. Courtaulds, Ltd., 9, Park Hill, Clapham, London, S.W. 4.
- 1901 *Nash, Leonard Myddelton, Department of Industries and Manufactures, H.M. Board of Trade, Great George Street, London, S.W. 1.
- 1918 Naunton, William Johnson Smith, M.A. (Cantab.), M.Sc. (Lond.), Dip. Chem. (Munich), British Dyestuffs Corporation, Ltd., Blackley, Manchester.
- 1910 Naylor, Ernest Brooks, M.Sc. (Viet.), Eversleigh, Gathurst, near Wigan.
- 1915 *Naylor, Jonathan Harold, M.Sc. (Manc.), 20, Ingledow Crescent, Roundhay, Leeds.
- 1887 *Naylor, William Arthur Harrison, 22-30, Graham Street, City Road, London, N. 1.
- 1918 Nesbitt, Cosby Thomas, A.R.S.M., 18, Montrose Road, Sheffield.
- 1877 Nevill, Edmund Neville, F.R.S., Ellaker, Enys Road, Eastbourne.
- 1909 Neville, Professor Henry Allen Dugdale, B.Sc. (Lond.), M.A. (Cantab.), University College, Reading.
- 1918 Newbery, Edgar, B.Sc. (Lond.), D.Sc. (Viet.), The University, Cape Town.

- 1918  Newman, Leslie Frank, M.A. (Cantab.), St. Catharine's College, Cambridge.
- 1920 Newman, William Alfred Cyril, B.Sc., A.R.C.S. (Lond.), A.R.S.M., Assay Office, Royal Mint, London, E. 1.
- 1878 *Newth, George Samuel, Post Office, Tunbridge Wells.
- 1914 *Nicholls, John Ralph, B.Sc. (Lond.), 1A, Hillfield Gardens, Muswell Hill, London, N. 10.
- 1887 Nicol, William Walker James, M.A., D.Sc. (Edin.), 15, Blacket Place, Edinburgh. [e. 1888-92; c. 1903-06.]
- 1915 Nind, Edmund Robert, Pound House, near Hallow, Worcester.
- 1898 Nolan, Harold, M.D., LL.D. (Lond.), Bio-chemist, Western Pennsylvania Hospital, Pittsburg, Pa., U.S.A.
- 1918 Nolan, Thomas Joseph, B.A. (R.U.I.), D.Sc. (N.U.I.), 5, Sandhills, Stevenston, Ayrshire.
- 1912 Norman, George Marshall, A.R.C.S., B.Sc. (Lond.), Municipal School of Science, George Street, Hastings.
- 1916 Norris, Roland Victor, M.Sc (Manc.), D.Sc. (Lond.), Office of the Government Agricultural Chemist, College of Agriculture and Research Institute, Coimbatore, S. India.
- 1897 *Norris, Thomas Henry, Finsbury Technical College, Leonard Street, City Road, London, E.C. 2.
- 1917 Norris, William Henry Hobbs, B.A. (Cantab.), B.Sc. (Lond.), 23, The Crescent, Prestwich, Manchester.
- 1917 North, Barker, A.R.C.S., 33, Ashgrove, Bradford, Yorks.
- 1904 *Northall-Laurie, Dudley, 41, Lyncroft Gardens, London, N.W. 6. [c. 1916-19.]
- 1905 Nuttall, Walter Harold, 21, University Gardens, Hillhead, Glasgow.

O

- 1919 O'Brien, Frederick, M.Sc. (Vict.), 4, Queen Square, Bristol.
- 1892 Oddy, Robert Walter, Abbey Street, Toad Lane, Rochdale.
- 1878 *Odling, Walter, c/o Messrs. Bass, Ratcliff & Gretton, Ltd., Burton-on-Trent.
- 1917 O'Farrelly, Alfons, M.A. (R.U.I.), 26, Highfield Road, Rathgar, co. Dublin.
- 1919 Ogilvie, James Maclaren, B.Sc. (Edin.), 23, Portland Street, Huddersfield.
- 1910 Okell, Frederick Leigh, c/o The Straits Trading Co., Ltd., Singapore, Straits Settlements.
- 1918 Oldroyd, Rowland Ernest, 90, Park Road, Rochdale.
- 1919 O'Neill, Charles, c/o The Bleachers Association, 4, Norfolk Street, Manchester.
- 1917 Orange, Lionel, M.B.E., B.Sc. (Lond.), Chemistry Department, Rutherford Technical College, Newcastle-on-Tyne.
- 1919 Ormandy, William Reginald, D.Sc. (Tübingen), 18, Belsize Grove, Belsize Park, London, N.W. 3.

- 1903 *Orton, Professor Kennedy Joseph Previté, M.A. (Cantab.), Ph.D. (Heidelberg), Old Buildings, University College of North Wales, Bangor. [c. 1908 11.]
- 1909 O'Shaughnessy, Bernard, A.R.C.S. (Lond.), Central Technical Institute, Waterford.
- 1904 O'Shaughnessy, Francis Richard, A.R.C.S. (Lond.), Deuman Chambers, 42, Temple Street, Birmingham. [c. 1914 17.]
- 1887 O'Sullivan, James, High Bank, Burton-on-Trent.

P

- 1895 Page, Professor Hastings Montague, Government College of Science, Poona, India.
- 1909 Page, Reginald Percival, Chemical Laboratory, 16, Arundel Street, Portsmouth.
- 1906 Paine, Sydney Gross, D.Sc. (Lond.), Imperial College of Science and Technology, South Kensington, London, S.W. 7.
- 1904 Pakes, Walter Charles Cross, M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.P.H. (Cantab.), 119, Edward Street, Nuneaton.
- 1918 Palmer, William Josiah, 63, Parkside, Eltham, London, S.E. 9.
- 1909 Parker, James Gordon, Ph.D. (Strassburg), Scotsraig, Beaconsfield Road, Blackheath, London, S.E. 3.
- 1921 Parker, Leslie Henry, M.A. (Cantab.), D.Sc. (Lond.), The Experimental Station, Porton, near Salisbury, Wilts.
- 1916 Parker, Professor Matthew Archibald, B.Sc. (Glas.), The University of Manitoba, Winnipeg, Canada.
- 1905 Parker, William Bayley, 1, Murray Road, Rugby.
- 1901 *Parkes, Albert Edward, Chemical Laboratory, 74, Foyle Road, Westcombe Park, London, S.E. 3.
- 1896 Parry, Ernest John, B.Sc. (Lond.), Barrister-at-Law, Thanet House, 56, Great Dover Street, London, S.E. 1.
- 1905 Partridge, William, 30, Great James Street, Bedford Row, London, W.C. 1.
- 1918 *Passmore, Francis William, Ph.D. (Würzburg), 81, Queen Victoria Street, London, E.C. 4.
- 1919 Paterson, John Hamilton, D.Sc. (Dun.), Neville Chambers, Westgate Road, Newcastle-on-Tyne.
- 1912 Patrick, Oscar James, B.Sc. (Lond.), Guyhirne, Seal Hollow Road, Sevenoaks, Kent.
- 1903 *Paul, James Hugh, B.Sc. (Lond.), 11, Glenluce Road, Blackheath, London, S.E. 3.
- 1887 Paul, Lewis Gordon, Ph.D. (Tübingen), Borough Laboratory, Market Hall Chambers, Huddersfield.
- 1913 *Paulley, William Minterne, B.A. (Cantab.), Egerton, Ashford Road, Cheltenham.
- 1891 Pauls, Charles Alfred, M.Sc. (Vict.), 3, Marian Villas, Rhuddlan, N. Wales.

- 1917 Peachey, Stanley John, M.Sc.Tech. (Vict.), 44, Platts Lane, Hampstead, London, N.W. 3.
- 1917 Peacock, David Henry, B.A. (Cantab.), B.Sc. (Lond.), 5, Virginia Road, Marsh, Huddersfield.
- 1918 Pearson, Archibald Ramsden, B.Sc., A.R.C.S. (Lond.), Imperial College Union, Prince Consort Road, London, S.W. 7.
- 1900 *Peck, Ernest Lawrence, B.Sc. (Vict.), Ph.D. (Jena), Edgeworth, Bebington, Cheshire.
- 1918 Peddle, Cyril James, M.B.E., D.Sc. (Sheff.), Ravenscliffe, Turnditch, nr. Derby.
- 1909 Pelly, Russell George, 3, Wingate Road, Hammersmith, London, W. 6.
- 1887 Perkin, Arthur George, F.R.S., Grosvenor Lodge, Grosvenor Road, Leeds.
- 1911 Perkin, Frederick Mollwo, C.B.E., Ph.D. (Würzburg), Albion House, 59, New Oxford Street, London, W.C. 1. [1920-.]
- 1918 *Perman, Edgar Philip, D.Sc. (Lond.), University College, Cardiff.
- 1897 Perry, George Henry, O.B.E., B.Sc., A.R.C.S. (Lond.), Directorate of Chemical Inspection, Royal Arsenal, Woolwich, London, S.E. 18. [c. 1918-21.]
- 1905 Peters, William Harold, Metropolitan Carriage, Wagon and Finance Co., Ltd., Saltley, Birmingham.
- 1912 Petrie, Alexander Swanston.
- 1914 Petrie, George Campbell, Cia Mexicana de Petroleo El Aguila, S.A., Refineria de Petroleo, Minatitlan, Mexico.
- 1903 Petrie, James Mathew, D.Sc. (Sydney), The University, Sydney, N.S.W., Australia.
- 1888 Pettigrew, John, 7, Victoria Street, Westminster, London, S.W. 1.
- 1887 Philip, Arnold, B.Sc. (Lond.), A.R.S.M., The Chemical Department, H.M. Dockyard, Portsmouth.
- 1919 Philip, James Charles, O.B.E., M.A., D.Sc. (Aberd.), Ph.D. (Göttingen), The Imperial College of Science and Technology, London, S.W. 7.
- 1919 Phillips, Henry Ablett, Royal Gunpowder Factory, Waltham Abbey, Essex.
- 1913 *Phillips, Professor Percy Philip, Ph.D. (Göttingen), Rurki, United Provinces, India.
- 1916 Pickard, Joseph Allen, B.Sc., A.R.C.S. (Lond.), 21, Rosemont Road, Acton, London, W. 3.
- 1902 *Pickard, Robert Howson, D.Sc. (Lond.), Ph.D. (Munich), B.Sc. (Birm.), F.R.S., Battersea Polytechnic, London, S.W. 11.
- 1895 Pickford, Samuel, A.R.C.Sc.I., Church Road, Leyland, Preston.
- 1917 Picton, Norman, B.Sc. (Wales), Ph.D. (Leipzig), 12, Sorbie Road, Saltecoats, Ayrshire.
- 1893 *Pike, Alfred Edridge, c/o Messrs. Doulton & Co., Ltd., Royal Doulton Potteries, Lambeth, London, S.E. 1.
- 1904 *Pinchin, Ernest Alfred, B.Sc. (Lond.), 4, Gleneldon Road, Streatham, London, S.W. 16.
- 1918 Pinnock, Henry Tremayne, M.A. (Oxon.), 11, Fountain Road, Edgbaston, Birmingham.

- 1919 Pitt, Arthur Ernest, B.Sc. (Lond.), Sewardstone, 46, Spratt Hall Road, Wanstead, London, E. 11.
- 1907 Pizey, James Henry, A.R.C.S., 38, Lewisham Road, Dartmouth Park, London, N.W. 5.
- 1894 Platts, John Charles, 6a, Fairfield Square, Droylsden, nr. Manchester.
- 1909 Pollard, William, M.A. (Cantab.), D.Sc. (Tübingen), Oakfield, Hitchin, Herts.
- 1914 Pollock, Ernest Ferguson, Ph.D. (Jena), 22, Osborne Road, Huddersfield.
- 1914 Pool, George Erskine, B.Sc. (Lond.), Technical College, Derby.
- 1911 Poole, Evan Skull, B.Sc. (Lond.), 7, Liverpool Road, Ealing, London, W. 5.
- 1918 Pope, Rupert William, B.Sc. (Lond.), 10, Malpas Road, Brockley, London, S.E. 4.
- 1903 Pope, Thomas Henry, B.Sc. (Birm.), A.C.G.I., 2, Belmont Street, Hillhead, Glasgow.
- 1899 Pope, Professor Sir William Jackson, K.B.E., Hon. M.A. (Cantab.), Hon. LL.D. (McGill), M.Sc.Tech. (Mane.), F.C.G.I., F.R.S., Holmsdale, Brooklands Avenue, Cambridge. [c. 1903-06, 09-12 ; e. 1913-19.]
- 1911 Porritt, Benjamin Dawson, M.Sc. (Lond.), Research Association of British Rubber and Tyre Manufacturers, University College, Gower Street, London, W.C. 1. [c. 1920-.]
- 1918 Porter, James Walker, A.R.C.Sc.I., 35, Templemore Avenue, Belfast.
- 1916 Potter, Francis Martin, M.B.E., B.Sc., A.R.C.S. (Lond.), The Gas Light and Coke Co., Products Works, Beekton, East Ham, London, E. 6.
- 1917 Potter, Howard Vincent, B.Sc. (Lond.), The Cottage, Wootton Waven, Birmingham.
- 1919 Powney, William Edmund Francis, L.C.C. Power Station,³ Hoskins Street, Greenwich, London, S.E. 10.
- 1915 Pratt, Walter Ryley, B.Sc. (Lond.), 7, Orchard Road, Barnet, Herts.
- 1915 Prescott, William George, B.Sc. (Lond.), c/o La Forestal, Ltda., Villa Guillermina, F.C.S.F., Ramal al Rey, Prov. de Santa Fé, Argentine Republic.
- 1905 Price, Thomas Slater, O.B.E., D.Sc. (Lond. and Birm.), Ph.D. (Leipzig), c/o The Institute of Chemistry. [e. 1907-11 ; c. 1911-14, 21-.]
- 1919 Prideaux, Edmund Brydges Rudhall, M.A., B.Sc. (N.Z.), D.Sc. (Lond.), University College, Nottingham.
- 1905 Priest, Martin, Fir Cottage, Lamorbey, Sidecup, Kent.
- 1891 *Procter, Professor Henry Richardson, D.Sc., Hon.M.Sc. (Leeds), The University, Leeds. [c. 1902-04.]
- 1887 *Proctor, Charles, 118, Grosvenor Road, London, S.W. 1. [c. 1910-13.]
- 1902 Purvis, John Edward, M.A. (Cantab.), A.R.C.Sc.I., The University Chemical Laboratory, Cambridge.
- 1919 Pyman, Frank Lee, D.Sc. (Vict.), Ph.D. (Bâle), College of Technology, Manchester.

Q

- 1895 *Quinn, James Cardwell, M.Sc. (Mane.).

R

- 1908 Race, Joseph, St. Hilda's, Hafod Road, Hereford.
- 1918 Radcliffe, Lionel Guy, M.Sc.Tech. (Manc.), 929, Chester Road, Stretford, Manchester.
- 1921 Raistrick, Harold, D.Sc. (Leeds), B.A. (Cantab.), Messrs. Nobel's Explosives Co., Ardeer Factory, Stevenston, Ayrshire.
- 1897 *Ralston, William, B.Sc. (Lond.), Abbotsford, 321, Shrewsbury Road, East Ham, London, E. 7.
- 1893 Ramage, Hugh, M.A. (Cantab.), A.R.C.Sc.I., The Technical Institute, Norwich.
- 1905 Ramsay, William, 23, Sycamore Road, Higher Tranmere, Birkenhead.
- 1918 Raper, Henry Stanley, C.B.E., D.Sc. (Vict.), M.B., Ch.B. (Leeds), The School of Medicine, Thoresby Place, Leeds.
- 1920 Ratcliffe, Norman, c/o Messrs. J. Nathan and Co., Ltd., Queen Street, Palmerston North, New Zealand.
- 1916 Rawling, Francis George, M.Sc. (Leeds), c/o The West Virginia Pulp and Paper Co., Piedmont, West Virginia, U.S.A.
- 1910 Rawlins, Henry James Bawtree, B.Sc. (Lond.), 4, Haydn Avenue, Purley, Surrey.
- 1888 *Rawson, Christopher, 22, Cumberland Street, Manchester.
- 1888 Ray, William, 59, Haydn Avenue, Parker Street, Whitworth Park, Manchester.
- 1915 Rayner, Archibald, B.Sc. (Lond.), 45, Gilpin Avenue, East Sheen, London, S.W. 14.
- 1895 *Read, Professor Arthur Avery, D. Met. (Sheffield), University College, Newport Road, Cardiff.
- 1901 *Read, Edwin James, B.A. (Cantab.), c/o The Pretoria Portland Cement Co., Ltd., P.O. Box 405, Pretoria, S. Africa.
- 1913 *Read, William John, M.Sc. (Manc.), Cornholme, Bradford Road, Wakefield.
- 1919 Redpath, George Christie, 76, Eastbourne Gardens, Monkseaton, Northumberland.
- 1918 Rée, Alfred, Ph.D. (Berne), 15, Mauldeth Road, Withington, Manchester.
- 1886 Reed, Lester, Hyrsthof, South Park Hill Road, South Croydon.
- 1911 Reed, Walter William, M.Sc. (Wales), The Technical Institute, Norwich.
- 1890 *Reeks, Trenham Howard, A.R.S.M., 106, Queen Victoria Street, London, E.C. 4.
- 1917 Rees, Walter James, Department of Applied Science, St. George's Square, Sheffield.
- 1912 Reeve, Howard Teesdale, 38, N. Burnett Street, E. Orange, N.J., U.S.A.
- 1914 Reid, John Fountain, Hazeldene, Forest Road, Melksham, Wilts.
- 1888 *Reid, Walter Francis, Fieldside, Addlestone, Surrey.
- 1921 Reilly, Joseph, M.A., D.Sc. (R.U.I.), F.R.C.Sc.I., Royal Naval Cordite Factory, Holton Heath, nr. Wareham, Dorset.

- 1880 *Rennie, Professor Edward Henry, D.Sc. (Lond.), University of Adelaide, South Australia.
- 1918 Renwick, Frank Forster, 45, Heath Drive, Gidea Park, Essex.
- 1917 Revis, Cecil, A.C.G.I., 94, Station Road, Barnes, London, S.W. 13.
- 1915 Reynard, Otto, B.A. (Cantab.), 47, Kent Road, Harrogate.
- 1917 Reynolds, William Colebrook, D.Sc., A.R.C.S. (Lond.), Wharfedale, Upminster, Essex.
- 1908 *Rhead, Ezra Lobb, M.Sc. Tech. (Mane.), Sunnyside, Polygon Avenue, Levenshulme, Manchester.
- 1899 Rhodin, John Gustaf Adolf, 52, Holland Road, Kensington, London, W. 14.
- 1912 Richards, Eric Hannaford, B.Sc. (Lond.), Lawes Agricultural Trust, Rothamsted Experimental Station, Harpenden.
- 1894 *Richards, Percy Andrew Ellis, Royal Dental Hospital, Leicester Square, London, W.C. 2. [c. 1901-04, 1915-18; e. 1911-15.]
- 1897 *Richardson, Frederic William, Oak Lea, Menston, Yorks.
- 1887 Richmond, Henry Droop, 33, Addison Road, Nottingham. [c. 1906-09, 10-13.]
- 1905 Richmond, Sylvester Oliffe, Inspector of Victualling Stores, Royal William Yard, Plymouth. [c. 1913-15.]
- 1918 *Rideal, Eric Keightley, M.B.E., B.A. (Cantab.), Ph.D. (Bonn), D.Sc. (Lond.), 28, Victoria Street, London, S.W. 1.
- 1878 *Rideal, Samuel, D.Sc. (Lond.), 28, Victoria Street, Westminster, London, S.W. 1. [c. 1899-1902.]
- 1887 *Ridsdale, Charles Henry, 3, Wilson Street, Middlesbrough, Yorks.
- 1894 *Rigby, William Thomas, County Analyst's Laboratory, 14, Temple Street, Birmingham.
- 1907 Riley, Louis John Ezekiel, 8, Newton Road, London, W. 2.
- 1913 Riley, William Albert, Robin Hood Coke Works, Robin Hood, Wakefield.
- 1903 *Rintoul, William, O.B.E., Lauriston, Ardrossan, Ayrshire. [c. 1917-20, 1921-.]
- 1919 Ritchie, William Stonebridge, B.Sc. (Lond.), 23, Kelvinside Gardens, E., Glasgow.
- 1918 Rixon, Frederic William, M.Sc. (Vict.), Ph.D. (Giessen), 6, Hillside, Cotham, Bristol.
- 1915 Robb, Marshall Jeffreys, B.Sc. (Aberd.), Westbank, Fonthill Road, Aberdeen.
- 1918 Roberts, Caryl Cameron, M.A. (Cantab.), 19, Watling Street, Canterbury.
- 1916 Roberts, Oswald Digby, 6, Park Hill Rise, Croydon, Surrey.
- 1915 *Roberts, Walter Morrell, M.Sc. (Mane.), The Cedars, Whalley Range, Manchester.
- 1905 Roberts, William Henry, M.Sc. (Vict. and Liv.), City Analyst's Department, City Laboratories, Mount Pleasant, Liverpool. [c. 1915-18, 1921-.]
- 1904 *Robertson, Andrew John, D.Sc. (St. Andrews), e/o Messrs. J. & J. White, Shawfield Chemical Works, Rutherglen, near Glasgow.

- 1919 Robertson, Joseph Gold, Ph.D. (Jena), 19, Broomhill Terrace, Partick, Glasgow.
- 1897 Robertson, Sir Robert, K.B.E., D.Sc., M.A. (St Andrews), F.R.S., Government Laboratory, Clements Inn Passage, Strand, London, W.C. 2. [c. 1915-18; v.-p. 1918-21; c. 1921-.]
- 1919 Robertson, Stewart, 41, Rowallan Gardens, Broomhill, Glasgow.
- 1902 Robins, Walter, B.Sc. (Lond.), Lyme House, Grove Hill, Woodford, Essex.
- 1917 Robinson, Charles Stanley, B.A. (Cantab.), Cape Explosives Works, Ltd., 15, St. Swithin's Lane, London, E.C. 4.
- 1916 Robinson, Frederic, M.Sc.Tech. (Manc.), B.Sc. (Lond.), The Hollies, Mile End, Stockport.
- 1887 *Robinson, Henry Haliburton, M.A. (Oxon.), 42, Penywern Road, Earl's Court, London, S.W. 5.
- 1918 Robinson, Professor Robert, D.Sc. (Manc.), Director of Research, British Dyestuffs Corporation, Ltd., Huddersfield.
- 1908 Robison, Robert, B.Sc. (Lond.), Ph.D. (Leipzig), 78, Primrose Mansions, Battersea Park, London, S.W. 11.
- 1893 *Robson, James, Allan Park, Inellan, Scotland.
- 1917 Rodger, Robert, 4, Stevenage Road, Bishop's Park, Fulham, London, S.W. 6.
- 1896 Rogers, George Joseph, ² A.R.C.S., 32, Chudleigh Road, Brockley, London, S.E. 4.
- 1904 Rogers, John, O.B.E., c/o Messrs. Nobel's Explosives Co., Ltd., West George Street, Glasgow.
- 1920¹ Rogers, Sidney John, B.Sc. (Lond.), 137, Clements Road, East Ham, London, E. 6.
- 1908 Rogers, William David, A.R.C.S., B.Sc. (Lond.), 430, Wellington Road North, Heaton Chapel, Stockport.
- 1911 Rolfe, Robert Thatcher, c/o Messrs. W. H. Allen, Son & Co., Ltd., Queen's Engineering Works, Bedford.
- 1919 *Romanes, John William, B.Sc. (Edin.), 13, Merchiston Avenue, Edinburgh.
- 1919 Roos, Charles Bernard, B.Sc. (Lond.), 26, Heathdene Road, Streatham, London, S.W. 16.
- 1916 Rose, Sir Thomas Kirke, A.R.S.M., D.Sc. (Lond.), Royal Mint, London, E. 1.
- 1898 *Ross, Arthur, 1, Glengall Road, Old Kent Road, London, S.E. 15.
- 1897 Ross, Raymond St. George, Public Analyst's Office, Burnley, Lancs.
- 1897 *Rossiter, Edmund Charles, A.C.G.I., Brougham, West Hagley, Worcester-shire.
- 1917 Rotter, Godfrey, O.B.E., D.Sc. (Wales), 2, Parkhill Road, Sidecup, Kent.
- 1891 *Rowden, William Clement, A.R.S.M., Kia Ora, Arthog Road, Hale, Cheshire.
- 1921 Rowe, Frederick Maurice, D.Sc. (Leeds), College of Technology, Manchester.
- 1913 Rowe, Walter² Tidd, Department of Chemistry, Victoria Square West, Adelaide, South Australia.

- 1889 Rowland, James Scott, 89, Stacy Road, Roath, Cardiff.
 1888 *Ruddock, Frederick Grevile, Corporation Street, Warrington.
 1919 Rule, Alexander, M.Sc. (Viet.), Ph.D. (Jena), Chemical Industry Club,
 2, Whitehall Court, London, S.W. 1.
 1888 Rumble, Charles, 169, Gleneldon Road, Streatham, London, S.W. 16.
 1898 *Russell, Edward, B.Sc. (London), 28, Apsley Road, Clifton, Bristol.
 1888 Russell, William, Chemistry Department, Municipal Technical School,
 Suffolk Street, Birmingham.
 1904 Ryan, Hugh, M.A., D.Sc. (R.U.I.), St. Brendan's, Cross Avenue, Booters-
 town, Co. Dublin.
 1909 Ryffel, John Henry, M.A. (Cantab.), B.Sc. (Lond.), Guy's Hospital,
 London, S.E. 1.

S

- 1909 *Sage, Charles Edward, 10, London Street, Fenchurch Street, London,
 E.C. 3.
 1916 Sageman, Philip John, 65, Anson Road, Tufnell Park, London, N. 7.
 1896 Salmon, Edgar Henry Rider, Pharmacia Salmon, Santo Eugenio,
 Estado Oriental, Uruguay (*viâ* Monte Video).
 1912 *Salter, Charles, A.R.C.S., A.R.S.M., Straits Trading Co., Ltd., Singapore.
 1878 *Salter, Mortyn John, Greyrick House, Mickleton, Glos.
 1920 *Sand, Henry Julius Salomon, Ph.D. (Zurich), D.Sc. (Birm.), Sir John
 Cass Technical Institute, Jewry Street, Aldgate, London, E.C. 3.
 1919 Sanders, James McConnell, Holly House, Welling, Kent.
 1896 Sanderson, John, c/o Messrs. Arthur Johnson, Ltd., Britannia Pencil
 Works, Neasden Lane, London, N.W. 10
 1888 *Saul, John Edward, Black Warren, Radlett, Herts.
 1911 Sawbridge, Bartle Frere, M.A. (Oxon.), 75, Abington Road, Kensington,
 London, W. 8.
 1897 Sawers, William Duncan, Woodend, Eastwood, Giffnock, near Glasgow.
 1888 *Sayers, Joseph, Groundwell Manor, Blunsdon, near Swindon.
 1899 Seard, Frederic Isenbart, The West India Committee Rooms, 15, Seething
 Lane, London, E.C. 3.
 1900 *Schack-Sommer, Gustaf Adolf Otto, Ph.D. (Heid.), 87, Victoria Street,
 London, S.W. 1.
 1901 *Schofield, James Alexander, A.R.S.M., The University, Sydney, N.S.W.,
 Australia.
 1916 Scholefield, Fred, M.Sc. (Viet.), B.Sc. (Lond. and Leeds), c/o Messrs.
 Burgess, Ledward & Co., Ltd. (Dyehouse Dept.), Walkden, Man-
 chester.
 1915 Schotz, Schachno Peisach, B.Sc. (Lond.), D.Sc.Tech. (Zurich), 112,
 Wellington Road South, Hounslow, London, W.
 1919 Schwarz, Theodor, Ingeniero Quimico, La Esperanza, Gomez Palacio,
 Durango, Mexico.
 1902 *Scott, Alexander, M.A., Sc.D. (Cantab.), D.Sc. (Edin.), F.R.S., 34, Upper
 Hamilton Terrace, London, N.W. 8. [c. 1903-06.]

- 1900 *Scott, Andrew Laidlaw, Royal Gunpowder Factory, Waltham Abbey, Essex.
- 1919 Scott, Arthur William, A.C.G.I., 7, Riggindale Road, Streatham, London, S.W. 16.
- 1898 Scott-Smith, George Egerton, Ashleigh, Bamford, Derbyshire.
- 1906 Scruton, Harold Adams, B.Sc. (Lond. and Leeds), Hill Crest, Elloughton, Brough, E. Yorks.
- 1893 Scrutton, Willis James Campbell, La Cumeragua, Aroa, Venezuela.
- 1895 *Scudder, Frank, c/o The Mersey and Irwell Joint Committee, 44, Moseley Street, Manchester.
- 1910 Seaber, Willie Macro, B.Sc. (Lond.), Cia Mexicana de Petroleo El Aguila, S.A., Avenida Jaurez, 89, Mexico.
- 1898 Seabrooke, Herbert Cecil, Black Ash, Grays, Essex.
- 1912 Self, Percy Arthur William, B.Sc. (Lond.), 53, St, Saviour's Road, Croydon, Surrey.
- 1915 Senter, George, D.Sc (Lond.), Ph.D. (Leipzig), The Birkbeck College, Bream's Buildings, Chancery Lane, E.C. 4.
- 1895 Seyler, Clarence Arthur, B.Sc. (Lond.), Hindfell, Eaton Crescent, Swansea. [c. 1912-15.]
- 1920 Shankster, Harry, 138, Elgin Road, Seven Kings, Essex.
- 1917 Sharp, David Easton, B.Sc. (Aberd.), c/o Mr. Caldwell, Blackford, Saltcoats, Ayrshire.
- 1898 Sharrott, Thomas Chilwell, A.R.C.S. (Lond.), B.A. (Dublin), Hackney Downs School, Clapton, London, E. 8.
- 1897 *Shaw, George Elliott, B.Sc. (Lond.), Mungpoo P.O., Riyang, D. H. Ry., India.
- 1905 Shedden, Frank, B.Sc. (Lond.), c/o Messrs. Courtaulds, Ltd., Flint, N. Wales.
- 1891 Shegog, Thomas Alexander, A.R.C.Sc.I., 167, West 130th Street, New York, U.S.A.
- 1899 Shelbourn, Edward Thomas, Evington, Park Road, Hampton Hill, Middlesex.
- 1908 Sheldon, John Charles, Hafod Isha Works, Swansea.
- 1907 Sheldon, Norman Lindsay, Ph.D. (Heidelberg), Chief Inspector of Explosives, 1, Council House Street, Calcutta, India.
- 1909 Shelley, Frederick Farey, Apothecaries' Hall, Blackfriars, London, E.C. 4.
- 1918 Shelton, Arthur John, A.C.G.I., 10, Park Road, Clydach S.O., Glam.
- 1913 *Shelton, James, Batu Gajah, F.M.S.
- 1919 Shenton, James Porter, 37, Torbay Road, Chorlton-cum-Hardy, Manchester.
- 1910 Shephard, Frederick George, D.Sc. (N.U.I.), B.Sc., A.R.C.S. (Lond.), Ockbrook, nr. Derby.
- 1905 Shepherd, Arthur Burton, B.Sc. (Vict.), c/o The British Oil and Cake Mills, Ltd., Copenhagen Oil Mills, Limehouse, London, E. 14.
- 1916 Shepherd, Evelyn Henry, B.Sc. (Lond.), The Laurels, 36, Green Lawn, Rock Ferry, Cheshire.

- 1878 *Shepherd, Harcourt Henry Benjamin, 8, The Park, Sidecup.
- 1918 Short, Andrew, B.Sc. (Dun.), 23, Hotspur Street, Tynemouth.
- 1890 Short, Frederick William, B.Sc. (Lond.), Wanderer Mine, Selukwe, Rhodesia, S. Africa.
- 1908 Shrewsbury, Herbert Sutcliffe, Government Laboratory, Port of Spain, Trinidad, B.W. Indies.
- 1889 Shutt, Frank Thomas, M.A., D.Sc. (Toronto), Chief Chemist, Experimental Farm, Ottawa, Canada.
- 1889 Siebold, Alfred, Hibernia Works, Henry Street, Tipperary.
- 1891 Silvester, Harry, Hon. B.Sc. (Birm.), Paradise Buildings, 36, Paradise Street, Birmingham. [c. 1917-20.]
- 1909 Simmons, Robert, Ashleigh, New Malden, Surrey.
- 1914 Simmons, Thomas Arthur, B.Sc. (Lond.), 27, Lyndale Avenue, Birkby, Huddersfield.
- 1917 Simmons, William Herbert, B.Sc. (Lond.), 96, Victoria Street, Westminster, London, S.W. 1.
- 1916 *Simonsen, Professor John Lionel, D.Sc. (Manc.), The Forest Research Institute and College, Dehra Dun, U.P., India.
- 1887 *Simpson, William Selby, Wyndercroft, Old Park Road, Enfield.
- 1921 Singh, Professor Bawa Kartar, M.A. (Cantab.), Sc.D. (Dub.), Patna College, Patna, Behar and Orissa, India.
- 1918 Sinnatt, Frank Sturdy, M.B.E., M.Sc.Tech. (Manc.), The College of Technology, Manchester.
- 1887 Skelton, John Richard, The Homestead, Thorpe, Norwich.
- 1899 Skertchly, William Pearson, Kenwyn, Station Road, Borrowash, near Derby.
- 1917 Slade, Roland Edgar, D.Sc. (Manc.), Winford, Billingham-on-Tees.
- 1888 Slater, Harold Humboldt, Casilla Correo 1475, Buenos Aires, S. America.
- 1904 *Slater, Arthur, Ph.D. (Leipzig), D.Sc. (Lond. and Birm.), 174, Ashby Road, Burton-on-Trent.
- 1880 *Slatter, George William, A.R.C.Sc.I., The Nab, Elmsleigh Road, Paignton, Devon.
- 1918 Smeaton, Thomas-Frederick, 43, Townsend Road, Rugby.
- 1884 *Smetham, Alfred, 16, Brunswick Street, Liverpool. [c. 1898-1901, 05-08, 10-13.]
- 1916 Smiles, Professor Samuel, O.B.E., D.Sc. (Lond.), F.R.S., King's College, Strand, London, W.C. 2.
- 1881 *Smith, Alfred Mica, School of Mines, Ballarat, Victoria, Australia.
- 1892 Smith, Angus, 7, Eldon Street, Greenock.
- 1911 *Smith, Arthur Richard, M.Sc. (Manc.), Royal Magazine Fort, Phoenix Park, Dublin.
- 1894 *Smith, Claude, Glen Lea, Cartmel, Grange-over-Sands.
- 1917 Smith, Ernest Woodhouse, D.Sc. (Vict.), Riverdale, Belmont Road, Leatherhead, Surrey. [c. 1919-.]
- 1911 Smith, Frank, B.Sc. (Adelaide), c/o J. C. Hutton Propty, Ltd., Zillmere, *via* Brisbane, Queensland, Australia.

- 1919 Smith, Frederick, Montrose, 1, Greenham Road, Muswell Hill, London. N. 10.
- 1908 Smith, Harry, Northgate, Albert Road, Southport.
- 1921 Smith, Henry Edgar, M.Sc. (Birm.), c/o Messrs. Meggitt's (1917), Ltd., Sutton-in-Ashfield, Notts.
- 1890 *Smith, Henry Heron, 43, Dunvegan Road, Eltham, London, S.E. 9.
- 1911 Smith, Henry Llewellyn, B.Sc. (Manc), 25A, Borneo Street, Putney, London, S.W. 15.
- 1882 Smith, Henry Russell, 1, Aubert Park, Highbury Park, London, N. 5.
- 1919 *Smith, James, 8, Inner Temple, Dale Street, Liverpool.
- 1908 *Smith, Lionel Leigh, M.A. (Cantab.), Crotleslei, Headley, Bordon, Hants.
- 1913 Smith, Percy Lancelot James, M.A. (Oxon.), Loretto School, Musselburgh.
- 1913 Smith, Sydney, B.Sc. (Lond.), Ph.D. (Kiel), Hollow Tree, Dartford Heath, Kent.
- 1914 Smith, Thomas Alfred, B.Sc. (Lond.), Southernis, Stanwell Moor, Middlesex.
- 1887 *Smith, Sir William Robert, M.D. (Aberd.), D.Sc. (Edin.), D.P.H. (Cantab.), Barrister-at-Law, 37, Russell Square, London, W.C. 1. [c. 1888-91.]
- 1887 *Smithells, Professor Arthur, C.M.G., B.Sc., (Lond. and Vict.), F.R.S., The University, Leeds. [c. 1890-93, 96-99, 1905-08, v.-p. 1915-17.]
- 1887 *Snape, Henry Lloyd, O.B.E., D.Sc. (Lond.), Ph.D. (Göttingen), Fernlea, Mill Lane, Torquay, Devon. [c. 1900-03.]
- 1918 Snelgrove, Frederick Walter, B.Sc. (Lond.), Hillborough, Pridmore Road, Foleshill, Coventry.
- 1892 Soane, Charles Emile, 31, Mattison Road, Hornsey, London, N. 4.
- 1899 *Sodeau, William Horace, D.Sc. (Lond.), Whitehead Torpedo Works, Weymouth.
- 1914 Sorley, James, A.R.T.C., c/o Messrs. Tatlock & Thomson, 156, Bath Street, Glasgow.
- 1898 *Southerden, Frank, B.Sc. (Lond.), 1, Gordon Road, Exeter.
- 1917 *Spackman, Charles, Rosehaugh, Clitheroe, Lancashire.
- 1909 *Spence, David, Ph.D. (Jena), c/o The Norwalk Tyre and Rubber Co., Norwalk, Connecticut, U.S.A.
- 1917 Spencer, Edmondson, A.R.S.M., c/o Messrs. Bird and Co., Calcutta, India.
- 1916 Spencer, James Frederick, D.Sc. (Liv.), Ph.D. (Breslau), 244, Croxted Road, Herne Hill, London, S.E. 24.
- 1908 Spielmann, Percy Edwin, Ph.D. (Bâle), B.Sc., A.R.C.S. (Lond.), Highways Construction, Ltd., Iddesleigh House, Caxton Street, London, S.W. 1.
- 1887 *Spiller, Arnold, 20, Holly Avenue, Newcastle-on-Tyne.
- 1878 Spiller, John, 2, St. Mary's Road, Canonbury, London, N.1. [c. 1880-83.]
- 1878 *Spiller, William, 2, Lindfield Gardens, Hampstead, London, N.W. 3. [c. 1893-96.]

- 1917 Sprent, William Colin, Dr. Ing., Dipl. Ing. (Dresden), 13, Eastern Drive, Cressington, Liverpool.
- 1916 Sproxton, Foster, B.Sc. (Lond.), The Gables, Manningtree, Essex.
- 1917 *Stanhill, David Bernard, B.Sc. (Lond.), Research Department, British Dyestuffs Corporation, Ltd., Blackley, Manchester.
- 1911 Stanley, Professor George Hardy, A.R.S.M., South African School of Mines and Technology, Johannesburg.
- 1913 Stanley, Harry, B.Sc. (Lond.), Merchant Venturers' Technical College, Bristol.
- 1900 *Stansbie, John Henry, B.Sc. (London), The Rowans, 145, Gravelly Hill, near Birmingham.
- 1900 Stansell, Lionel William, 7, Albion Place, Maidstone.
- 1878 Stead, John Edward, D.Met. (Sheffield), Hon. D.Sc. (Manc.), F.R.S., 11, Queen's Terrace, Middlesbrough. [c. 1906-09.]
- 1907 Steedman, George, Longford Chemical Works, Kilwinning, Ayrshire.
- 1918 Steele, Professor Bertram Dillon, D.Sc. (Melbourne), F.R.S., Department of Chemistry, University of Queensland, Brisbane.
- 1889 Stenhouse, Thomas, 166, Drake Street, Rochdale.
- 1909 Stenhouse, Thomas, jun., B.Sc., A.R.C.S. (Lond.), A.R.S.M., The Admiralty Chemist's Department, H.M. Dockyard, Portsmouth. [c. 1912-15.]
- 1918 Stephens, Frank Robert, 120, Pratt Street, London, N.W. 1.
- 1908 *Stephenson, Herbert Frederick, A.R.C.S., 325, Kennington Road, London, S.E. 11.
- 1895 *Stern, Arthur Landauer, D.Sc. (Lond.), 148, High Street, Burton-on-Trent.
- 1878 *Steuart, Daniel Rankin, 20, Hillview, Blackhall, Edinburgh.
- 1918 Steven, Alec Bowring, B.Sc. (Lond.), Royal Technical College, Glasgow.
- 1914 Stevens, Harold Blythen, O.B.E., Oxford Works, Tower Bridge Road, London, S.E. 1.
- 1902 Stevens, Henry Potter, M.A. (Oxon.), Ph.D. (Heid.), 15, Borough High Street, London, S.E. 1.
- 1913 Stevens, Montague White, A.R.C.S. (Lond.), Army Ordnance Depot, Hong Kong.
- 1911 Stevenson, Harold, 6, Cranbourne Road, Heaton Moor, Stockport.
- 1888 *Stewart, Samuel, c/o Messrs. Michael Nairn & Co., Ltd., Kirkcaldy, Fife.
- 1912 Stickland, Oliver Ward, B.Sc. (Lond.), Nobel House, Stevenston, Ayrshire.
- 1911 Stock, Cyril Joseph Heath, B.Sc. (Dun.), County Analyst's Office, Darlington, co. Durham. [c. 1921-.]
- 1893 Stocks, Herbert Birtwhistle, 33, Prenton Park Road, near Birkenhead, Cheshire.
- 1878 Stoker, George Naylor, Fairfield, Lessar Avenue, Clapham Common, London, S.W. 4.
- 1887 Stokes, Alfred Walter, 60, Parkhill Road, Haverstock Hill, London, N.W. 3.
- 1918 *Stokes, George Alfred, 60, Parkhill Road, Hampstead, London, N.W. 3.

- 1917 Storey, William Armstrong, B.Sc. (Lond.), Home Cottage, Wick, near Bristol.
- 1919 Storr, Bertram Vincent, M.Sc. (Vict.), 26, The Square, Ilford, Essex.
- 1918 Stroud, Sidney Hartnett, The University, Sydney, N.S.W., Australia.
- 1888 *Stuart, Charles Maddock, M.A. (Cantab.), St. Dunstan's College, Catford, London, S.E.
- 1911 Stubbs, George, C.B.E., Lingdale, Etchingham Park Road, Finchley, London, N. 3. [c. 1916-1919; v.-p. 1919-.]
- 1911 Stubbs, John Robert, M.Sc. (Vict. and Liv.), The County Laboratory, 36, Dansie Street, Liverpool.
- 1894 *Sudborough, Professor John Joseph, D.Sc. (Lond.), Ph.D. (Heid.), The Indian Institute of Science, Bangalore, India.
- 1902 *Sugden, John Henry, M.Sc. (Vict.), Cardiff and County Laboratory, 9, The Parade, Cardiff.
- 1915 Suggett, Arthur Frederick, 143, George Street, Bedford.
- 1889 Sulman, Henry Livingstone, 44, London Wall, London, E.C. 2.
- 1911 Summerson, Samuel, B.Sc. (Lond.), A.K.C., Maycourt, Tennison Road, S. Norwood, London, S.E. 25.
- 1887 *Sutherland, David Alexander, Victoria Mansions, 26, Victoria Street, London, S.W. 1. [c. 1904-07.]
- 1917 Sutherland, Miss Maggie Millen Jeffs, D.Sc. (Glas.), The Royal Technical College, Glasgow.
- 1905 Sutherst, Walter Frederick, Ph.D. (Geneva), c/o W. Sutherst, Esq., West Cliff, Chester Road, Northwich.
- 1889 *Sutton, Francis Napier, 21, Lydford Road, Cricklewood, London, N.W. 2. [c. 1906-09; 15-18.]
- 1898 *Sutton, William Lincolne, Hillcroft, Eaton, Norwich. [c. 1915-18.]
- 1901 *Swan, James Robertson, 58, Renfield Street, Glasgow.

T

- 1918 Tait, John William, M.A., B.Sc. (Edin.), The Pavilion, South Beach, Ardrossan, Ayrshire.
- 1919* Tallantyre, Snow Blagburn, B.Sc., A.R.C.S. (Lond.), Research Laboratory, Tar and Ammonia Products Works, Beckton, London, E. 16.
- 1908 Tankard, Arnold Rowsby, City Analyst, 40, Lowgate, Hull.
- 1888 Tate, George, Ph.D. (Würzburg), Windsor Buildings, George Street, Liverpool.
- 1877 *Tatlock, Robert Rattray, Kilarden, 153, Church Lane, Handsworth Wood, Birmingham. [c. 1877-80, 89-92, 1907-10.]
- 1907 Tattersall, George, B.Sc. (Lond.), M.Sc. (Manc.), The University of Western Australia, Perth, W. Australia.
- 1909 *Tattersfield, Frederick, B.Sc. (Lond.), The Laboratory, Rothamsted Experimental Station, Harpenden, Herts.
- 1918 Taylor, Edgar Reuben, A.R.S.M., County Technical College, Wednesbury.
- 1917 Taylor, George, 17, Great Tower Street, London, E.C. 3.

- 1918 Taylor, James^{Mc}McLean, Tynevale, Groes Road, Cressington, Liverpool.
- 1888 Taylor, Leo, Public Analyst's Laboratory, Moorgate Hall, Finsbury Pavement, London, E.C. 2. [c. 1902-05.]
- 1918 Taylor, Norman, B.Sc. (Manc.), Messrs. Nobel's Explosives Co., Ltd., Ardeer, Stevenston, Ayrshire.
- 1878 *Taylor, Robert Llewellyn, 37, Mayfield Road, Whalley Range, Manchester.
- 1904 Taylor, William Henry, B.Sc. (Lond.), Cornwood, Fawkham, Kent.
- 1888 Teed, Frank Litherland, D.Sc. (Lond.), 9, Mincing Lane, London, E.C. 3. [c. 1890-93.]
- 1906 Tempany, Harold Augustine, D.Sc. (Lond.), Department of Agriculture, 'Réduit, Mauritius.
- 1908 *Templeton, Samuel, A.R.C.Sc.I., School of Scientific Method and Chemistry, The Gables, Botanic Avenue, Belfast.
- 1891 Terry, Hubert Lanphier, Chemical Laboratory, 23, Hopwood Avenue, Market Place, Manchester.
- 1918 Theomin, Mrs. Ethel Grace, B.Sc. (Lond.), P.O. Box 40, Dunedin, New Zealand.
- 1921 Thole, Ferdinand Bernard, D.Sc. (Lond.), Meadhurst, Sunbury-on-Thames.
- 1901 Thomas, Albert Edward, B.Sc. (Lond.), Stanley House, Tavistock Road, Croydon, London, S.W.
- 1917 Thomas, John, B.A. (Cantab.), D.Sc. (Wales), Solway Dyes, Ltd., Murrell Hill Works, Carlisle.
- 1897 Thomason, William, c/o Messrs. Doulton & Co., Lambeth Pottery, London, S.E. 1.
- 1909 Thompson, Frank Ernest, A.R.C.S., The Laboratory, Walsall.
- 1916 *Thompson, Miss Gartha, B.Sc. (Lond.), 15, Mall Road, Hammersmith, London, W. 6.
- 1908 *Thompson, George Rudd, 69, Dock Street, Newport, Mon. [c. 1921-.]
- 1911 Thompson, James, Ph.D. (Heid.), Fir Cone Cottage, Churt, Surrey.
- 1918 *Thompson, John Thomas, M.Sc. (Leeds), Knostrop Sewage Works, Leeds.
- 1919 Thompson, Stanley, The Portland, St. John's Road, Buxton, Derbyshire.
- 1888 *Thomson, Andrew, M.A., D.Sc. (Edin.), 145, Bruntsfield Place, Edinburgh.
- 1888 Thomson, James Miln, M.B.E., Armadale, 56, Arnewood Road, West Southbourne, Hants.
- 1878 Thomson, Professor John Millar, Hon. LL.D. (Glas.), F.R.S., 55, Bedford Gardens, Kensington, London, W. 8. [c. 1882-85, 88-89, 91-94, 98-1900; e. 1887-92; v.-p. 1894-97, 1903-06, 10-13; r. 1894-1900; s. 1894-95; P. 1900-03; c. 1900-12.]
- 1887 Thomson, Robert Tatlock, 156, Bath Street, Glasgow.
- 1877 Thomson, William, Royal Institution Laboratory, 79a, Princess Street, Manchester. [c. 1887-90, 93-96.]
- 1917 Thomson, William Thomas, O.B.E., Heatherbank, St. Peter's Road, Parkstone, Dorset.

- 1895 *Thorne, Edward Ernest Howard, Bridgetown, Barbados, West Indies.
- 1884 *Thorne, Leonard Temple, Ph.D. (Würzburg), Southampton Wharf, Battersea, London, S.W.
- 1900 *Thorp, Walter, B.Sc. (Lond. and Leeds), Sorrentoville, Dalkey, co. Dublin.
- 1888 Thorpe, James Cole, M.A. (Oxon.), St. Bartholomew's Road, Reading.
- 1913 Thorpe, Professor Jocelyn Field, C.B.E., D.Sc. (Manc.), Ph.D. (Heid.), F.R.S., The Imperial College of Science and Technology, South Kensington, London, S.W. 7. [c. 1917-18; e. 1919-.]
- 1917 Threlfall, Sir Richard, K.B.E., M.A. (Cantab.), F.R.S., Oakhurst, Church Road, Edgbaston, Birmingham.
- 1887 Thresh, John Clough, D.Sc. (Lond.), M.D., B.Ch. (Vict.), D.P.H. (Cantab.), 91, Queen Victoria Street, London, E.C. 4.
- 1919 *Thudichum, George Dupré, 2, Edinburgh Mansions, Howick Place, London, S.W. 1.
- 1919 Thurston, Frank Stanley, B.Sc. (Lond.), c/o Messrs. W. & R. Jacob & Co., Ltd., Aintree, Liverpool.
- 1903 *Tickle, Thomas, B.Sc. (Lond.), Public Analyst's Laboratory, Exeter. [c. 1916-19.]
- 1878 *Tilden, Sir William Augustus, D.Sc. (Lond.), Hon. LL.D. (Birm.), Hon. Sc.D. (Dub.), Hon. D.Sc. (Vict.), F.R.S., The Oaks, Murray Road, Northwood, Middlesex. [c. 1881-84, 85-90; e. 1883-87; P. 1891-94; v.-p. 1894-97, 99-1902, 11-14; e. 1891-1901, 02-06. 10-13.]
- 1912 Tilley, Vernon James, Cleveland, Pollard's Hill East, Norbury, London, S.W. 16.
- 1917 Tinkler, Professor Charles Kenneth, B.Sc. (Lond. and Wales), D.Sc. (Birm.) King's College for Women (Household and Social Science Department), Campden Hill Road, London, W. 8.
- 1918 Titherley, Arthur Walsh, D.Sc. (Vict. and Liv.), Ph.D. (Heid.), The Tower, Llangollen, N. Wales.
- 1893 Tocher, James Fowler, D.Sc. (Aberd.), Crown Mansions, 41½, Union Street, Aberdeen.
- 1883 *Toms, Frederick Woodland, Official Analyst, Island of Jersey.
- 1910 Totton, Joseph Harold, B.A., B.Sc. (R.U.I.), 16, Donegall Square South, Belfast.
- 1917 Travers, Morris William, D.Sc. (Lond.), F.R.S., Beacon Hall, Priory Gardens, Highgate, London, N. 6.
- 1918 Trickett, Harold, 16, Midholm, Addison Way, Finchley, London, N.W. 4.
- 1887 *Trigger, Oliver, M.B.E., 14, Weech Road, West Hampstead, London, N.W. 6. [c. 1907-10, 12-15.]
- 1898 Trotman, Samuel Russell, M.A. (Cantab.), 1, Regent Street, Nottingham.
- 1918 *Trotter, John, M.A., D.Sc. (Edin.), c/o G. Laing, Esq., Refiner, 128, Nicolson Street, Edinburgh.
- 1915 Truelove, Rupert Harry, B.Sc., A.R.C.S. (Lond.), 3, The Avenue, Harold Wood, Essex.
- 1921 Tuck, William Bradshaw, D.Sc. (Lond.), 45, Bartholomew Road, London, N.W. 5.

- 1887 *Tucker, Alexander Edwin, 55, Station Street, Birmingham.
- 1918 *Tucker, Stanley Horwood, M.Sc., A.R.C.S. (Lond.), Lincoln College, Oxford.
- 1918 Tullo, James Wilson, B.Sc. (Edin.), St. Brendan's, Coolock, co. Dublin,
- 1918 Turnbull, Andrew, Ph.D. (Heid.), c/o Calder and Mersey Extract Co., Ltd., Ditton, nr. Widnes.
- 1901 Turnbull, Robert Hutchinson, 163, Hope Street, Glasgow.
- 1905 Turner, Professor Alfred John, B.Sc. (Lond.), The Victoria Technical Institute, Byculla, Bombay.
- 1887 *Turner, Professor Thomas, M.Sc. (Birm.), A.R.S.M., The University, Edmund Street, Birmingham.
- 1908 Twiss, Douglas Frank, D.Sc. (Birm.), B.Sc. (Lond.), Glendevon, Royal Road, Sutton Coldfield.
- 1897 Twynam, Thomas, Teeswold, Coatham Road, Redcar, Yorks.
- 1907 Tyler, Reginald, Mill Bank Cottage, Mansfield, Notts.
- 1887 *Typeke, Paul George William, Lawn House, New Malden, Surrey.

U

- 1918 Underhill, Thomas John, O.B.E., Stanley, 53, Lanercost Road, Tulse Hill Park, Brixton, S.W. 2.

V

- 1889 *Van Geyzel, Lieut.-Col. John Lawrence, C.I.E., M.B. (Aberd.), I.M.S., 23, Madeley Road, Ealing, London, W. 5.
- 1918 Vanstone, Ernest, M.Sc. (Wales), D.Sc. (Birm.), Seale-Hayne Agricultural College, Newton Abbot, Devon.
- 1917 Verteuil, Joseph de, 116, Frederick Street, Port of Spain, Trinidad, B.W.I.
- 1880 Vinson, William Ellis, c/o The Gloucester Gas Light Co., Gloucester.
- 1916 Vlies, Leonard Ellerton, Brantwood, Wilbraham Road, Alexandra Park, Manchester. [c. 1917-20, 21-.]
- 1880 Voelcker, Edward William, A.R.S.M., 1, Tudor Street, New Bridge Street, London, E.C. 4. [c. 1891-94, 96 99, 1904 07, 10 13; v.-p. 1913-16; c. 1916 18, 1919-; t. 1918-.]
- 1877 Voelcker, John Augustus, Ph.D. (Giessen), B.A., B.Sc. (Lond.), Hon. M.A. (Cantab.), 20, Upper Phillimore Gardens, Kensington, London, W. 8. [c. 1893 96, 1901-04, 07-10; v.-p. 1896-99; c. 1904 06.]

W

- 1904 *Wade, Frank, A.R.C.S., 26, St. Ronan's Avenue, Southsea, Hants.
- 1903 Wagstaffe, Ernest Arthur, Ph.D. (Munich), M.Sc. (Viet.), The Laboratory, 22, Blackfriars Street, Manchester.
- 1917 Walker, Andrew Jamieson, B.A. (R.U.I.), Ph.D. (Heid.), 5, Carlton Bank, Harpenden, Herts.

- 1888 *Walker, Archibald, M.A. (Oxon.), Newark Castle, Ayr.
- 1916 *Walker, Frederick George Cannon, M.C., Health Department, Municipal Council, Shanghai, China.
- 1916 *Walker, Professor Sir James, D.Sc. (Edin.), Ph.D. (Leipzig), F.R.S., 5, Wester Coates Road, Edinburgh. [c. 1921-.]
- 1901 Walker, John Allsop, M.A. (Oxon.), Flawford, Stapenhill, Burton-on-Trent.
- 1920 Walker, John Thom Ainslie, 14, Bride Lane, London, E.C. 4.
- 1906 Wall, Henry Lucas, 25, Morton Terrace, Gainsborough, Lincs.
- 1888 Waller, Bryan Charles, M.D. (Edin.), L.R.C.P. (Edin.), F.R.C.S. (Edin.), Masongill House, Ingleton, Yorks.
- 1906 *Wallis, Thomas Edward, B.Sc. (Lond.), 23, Leicester Road, East Finchley, London, N. 2.
- 1911 Walpole, George Stanley, D.Sc. (Melbourne), 121, Victoria Street, Westminster, London, S.W. 1.
- 1878 Ward, George, Buckingham Terrace, Headingley, Leeds.
- 1898 Warden, John Blair, 3, Eton Gardens, Glasgow.
- 1911 Warner, Charles Horne, B.Sc. (Lond.), M.B., B.S., M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.I.C., 25, Regent Street, Nottingham.
- 1901 *Warren, Bertram William John, Lamorna, Sutton Road, Southend-on-Sea.
- 1913 *Warrick, Robert Walter, Woodville, Welling, Kent.
- 1894 *Waterfall, Charles James, 4, Queen Square, Bristol.
- 1918 Watmough, Benjamin, Hatfeild Villa, Hatfeild Street, Wakefield, Yorks.
- 1894 Watson, Eric Edmund, 89, Brook Green, Hammersmith, London, W. 6.
- 1904 Watson, Frederick William, B.Sc. (Lond.), Metallurgical Laboratory, Rand Mines Ltd., Johannesburg, S. Africa.
- 1917 Watson, James, D.Sc. (Dun.), 10, Gray's Inn Square, London, W.C. 1.
- 1887 *Watson, John, 8, Hopkins Street, Yeoville, Johannesburg, S. Africa.
- 1916 Watson, John Adam, A.C.G.I., 24, Polwarth Gardens, Edinburgh.
- 1878 *Watt, Alexander, 29, Grange Mount, Cloughton, Birkenhead.
- 1908 Watt, Francis Langston, A.R.C.S., 5, Hamilton Street, Sydney, N.S.W., Australia.
- 1909 Watt, Henry Edgar, D.Sc. (Dun.), 4, Campbell Road, Edinburgh.
- 1890 Watts, Sir Francis, K.C.M.G., D.Sc. (Birm.), Imperial Commissioner of Agriculture for the West Indies, Barbados, West Indies.
- 1916 Watts, Hugh Edmund, M.B.E., Ph.D. (Zürich), B.Sc. (Lond.), Gordon House, Hutton, Essex.
- 1878 *Watts, John, M.A. (Oxon.), D.Sc. (Lond.), Chemical Laboratory, The Museum, Oxford.
- 1888 *Way, Edward John, 135-136, Cullinan Buildings, Simmonds Street, Johannesburg, Transvaal, South Africa.
- 1912 Weall, Horace Graham, Government Laboratories, Bloemfontein, South Africa.
- 1921 Webb, Harry William, M.Sc. (Birm.), Technical College, Cardiff.

- 1888 Webster, Charles Stuart Stanford, 6, The Quadrant, Redland, Bristol.
- 1904 Webster, John, Laboratory of Pathological Chemistry, St. Mary's Hospital, London, W. 2.
- 1891 Weeks, Henry Bridges, The Retreat, Infield Park, Barrow-in-Furness.
- 1910 Weir, James Morrison, M.A., B.Sc. (St. Andrews), St. Andrews Cottage, Ardrossan, Ayrshire.
- 1918 Weir, John, M.A., B.Sc. (St. Andrews), Ph.D. (Würzburg), Ardeer Factory, Stevenston, Ayrshire.
- 1914 *Wells, Gordon, B.Sc., A.R.C.S. (Lond.), A.R.S.M., Whitecote, Spencer Park, St. Albans.
- 1888 Werner, Professor Emil Alphonse, D.Sc. (Dublin), 1, Fairfield Park, Highfield Road, Rathgar, co. Dublin. [c. 1909-10.]
- 1887 *Wertheimer, Professor Julius, D.Sc. (Bris.), B.A., B.Sc., (Lond.), Merchant Venturers' Technical College, Bristol.
- 1900 West, Charles Alfred, B.Sc., A.R.C.S. (Lond.), 9, Tideswell Road, Putney, London, S.W. 15.
- 1880 Westmoreland, James William, A.R.S.M.
- 1918 Weston, Frank Edwin, B.Sc. (Lond.), 29, Sibeila Road, Clapham, London, S.W. 4.
- 1921 Weyman, Geoffrey, D.Sc. (Dun.), The Cwm, Saltwell Road, Low Fell, Gateshead-on-Tyne.
- 1911 Whalley, Lawrence John de, B.Sc. (Lond.), 18, Brandram Road, Lee, London, S.E. 13.
- 1899 Wharton, Frederick Malcolm, M.B.E., 74, Stanmore Road, Edgbaston, Birmingham.
- 1916 Wheatley, Robert, B.Sc. (Leeds), Balinard, Davidson's Mains, Midlothian.
- 1918 Wheeler, Edward George Gidleigh, B.Sc. (Lond.), 59, Cranwich Road, Stamford Hill, London, N. 16.
- 1919 Wheeler, Richard Vernon, D.Sc. (Viet.), The Bungalow, Eskmeals, Cumberland.
- 1878 *Whewell, George.
- 1878 *Whiffen, William George, Lombard Road, Battersea, London, S.W. 11.
- 1901 *White, Arthur Lee, B.Sc., A.R.C.S., (Lond.).
- 1892 White, Edmund, B.Sc. (Lond.), c/o Messrs. Hopkin & Williams, Ltd., 16, Cross Street, Hatton Garden, London, E.C. 1. [c. 1917-20.]
- 1918 White, Francis David, 100, Warrender Park Road, Edinburgh.
- 1921 White, Gerald Noel, D.Sc. (Lond.), 7, Victoria Avenue, Worcester.
- 1891 White, John, County Analyst, County Offices, St. Mary's Gate, Derby. [c. 1910-13.]
- 1919 White, John Christison, O.B.E., M.C., A.K.C., 44, Hendham Road, Wandsworth Common, London, S.W. 17.
- 1896 White, John Harry, A.R.S.M., Los Andes, Chile, S. America.
- 1918 *Whiteley, Miss Martha Annie, O.B.E., D.Sc. (Lond.), 111, Castlenau, Barnes, London, S.W. 13.

- 1887 *Whiteley, Richard Lloyd, 65, Birmingham Road, West Bromwich.
- 1899 *Whitton, James Tod, Messrs. Nobel's Explosives Works, Ardeer, Stevenston, Ayrshire.
- 1918 *Widdows, Miss Sibyl Taite, B.Sc. (Lond.), Holsworthy, Nether Street, Church End, Finchley, London, N. 3.
- 1918 Wilbraham, Evelyn Caryl Bootle, O.B.E., Ph.D. (Leipzig), 37, Russell Square, London, W.C. 1.
- 1902 Wild, Roland Cecil, The Grange, New Eltham, London, S.E. 9.
- 1911 Wilkie, John Matthew, B.Sc. (Lond.), 5, Balmoral Avenue, West Bridgford, Notts.
- 1919 Wilkinson, John Alfred Frome, B.Sc. (Lond.), Directorate of Chemical Inspection, Wellesley House, Red Lion Lane, Woolwich, London, S.E. 18.
- 1901 Willcox, Sir William Henry, K.C.I.E., C.B., C.M.G., M.D., B.Sc. (Lond.), D.P.H. (Conjoint Board), M.R.C.P., L.S.A. (Lond.), D.P.H. (Eng.) St. Mary's Hospital, Paddington, London, W. 2. [e. 1909-14: c. 1914-17.]
- 1919 Willey, George Brydon, A.R.S.M., 62, Glebe Road, Crookes, Sheffield.
- 1917 Williams, Edward, Bedw Cottage, Holywell, N. Wales.
- 1919 Williams, Herbert James, 5, Richmond Road, Uplands, Swansea.
- 1887 Williams, Rowland, 79, Queen Square, Lancaster.
- 1893 Williams, Walter Collingwood, B.Sc. (Lond.), The Public Analyst's Laboratories, 36, Dansie Street, Liverpool.
- 1918 Williams, William Arthur, 19, Craiglockhart Terrace, Edinburgh.
- 1894 *Williams, Professor William Carleton, B.Sc. (Vict.), Broomgrove, Goring-on-Thames.
- 1878 Williams, William John, Analytical and Technical Chemist, 1503, Foulkard Street, Frankford, Philadelphia, U.S.A.
- 1893 Williamson, Sidney, Ph.D. (Munich), c/o The Chilean Nitrate Committee, Friars House, New Broad Street, London, E.C. 2.
- 1917 *Wilsmore, Professor Norman Thomas Mortimer, D.Sc. (Melbourne), The University, Perth, W. Australia.
- 1919 Wilson, Arthur, M.C., Government Harness and Saddlery Factory, Cawnpore, India.
- 1884 Wilson, Charles Joseph, 14, Suffolk Street, Pall Mall, London, S.W. 1.
- 1909 Wilson, Ernest John, M.A. (Cantab), Osborne House, Wisbech.
- 1916 Wilson, Professor Forsyth James, D.Sc. (Edin.), Ph.D. (Leipzig), Chemistry Department, Royal Technical College, Glasgow.
- 1892 *Wilson, Harry, 32, Westwood Road, Southampton.
- 1909 Wilson, John, M.Sc. (Vict.), 79, Anglesea Road, Shirley, Southampton.
- 1917 Wilson, Lothian, B.Sc. (Lond.), 16, St. Margaret's Road, Plumstead, London, S.E. 18.
- 1918 Wilson, Thomas Alexander, c/o Messrs. Alexander Cross & Sons, Ltd., Research Laboratory, 23, Hope Street, Glasgow.
- 1904 *Winch, Howard James, Shivrajpur P.O., via Champaner Road Station, C. S. L. Ry., Panch Mahals, India.

- 1893 *Winder, Goodlatte Richardson, Ph.D. (Zürich), 1, Beech Road, Cheadle Hulme, Manchester.
- 1914 Winfield, Jacob, B.Sc. (Lond.), 190, Hammersmith Road, London, W. 6.
- 1892 Wirtz, Quirin, M.A., Ph.D. (Bonn), 32, Great Ormond Street, London, W.C. 1.
- 1914 Wood, Denys Richard, County Analyst, Boulevard, Weston-super-Mare.
- 1879 Wood, George William, A.K.C., Rossholme, Leigham Avenue, Streatham, London, S.W. 16.
- 1916 Wood, James, M.A., B.Sc. (Aberd.), c/o Research Department, Co-operative Wholesale Society, 109, Corporation Street, Manchester.
- 1919 Wood, John Kerfoot, D.Sc. (Vict.), 31, Rowan Avenue, Brooklands, Cheshire.
- 1915 Wood, Joseph Turney, 62, Park Road, Nottingham.
- 1919 Wood, Professor Thomas Barlow, M.A. (Cantab.), F.R.S., Gonville and Caius College, Cambridge.
- 1917 *Wood, William Francis John, C.B.E., B.Sc. (Lond.), Ardsley House, near Barnsley, Yorks.
- 1900 Woodhead, Samuel Allinson, D.Sc. (Dun.), Mountfield House, Lewes.
- 1887 *Woodward, James, B.A., B.Sc. (London), Drummond House, 31, Coventry Road, Ilford, Essex. [c. 1913-16.]
- 1893 Woosnam, Richard William, Rye Corner, Welholme Road, Grimsby.
- 1888 *Worrall, Jason Hall, Howsley, Chapeltown, near Sheffield.
- 1917 *Worthington, Arthur, Lynwood, Great Lever, Bolton.
- 1910 Wright, Charles Harold, B.A. (Cantab.), Department of Agriculture, Suva, Fiji.
- 1900 Wright, Leonard Victor, M.A. (Cantab.), Weston Way, Weston Favell, Northampton.
- 1921 *Wright, Richard Henry, 2, Hareourt Buildings, Temple, London, E.C. 4.
- 1897 Wright, Sidney Bristow, c/o The Deloro Smelting and Refining Co., Ltd., Deloro, Ontario, Canada.
- 1917 Wright, Walter Joseph, Poste Restante, Wimereux, France.
- 1887 *Wynne, Professor William Palmer, D.Sc., A.R.C.S. (Lond.), F.R.S., The University, Sheffield. [e. 1900-04 ; c. 1905-08.]

Y

- 1909 Yates, Joseph, M.Sc. (Manc.), B.Sc. (Lond.), Technical College, Derby.
- 1918 Yeoman, Ernest Wiekham, M.Sc., A.R.C.S., A.R.S.M. (Lond.), 1, Regent Square, London, W.C. 1.
- 1902 Young, Francis Samuel, M.A. (Oxon.), The College, Bishop's Stortford, Herts.
- 1909 Young, George, Ph.D. (Erlangen), 46, Church Crescent, Church End, Finchley, London, N. 3.
- 1899 *Young, Henry Stow, Kuching, Sarawak.
- 1918 Young, Horace John, Overdene, Ashfield Grove, Whitley Bay.

- 1914 Young, John, 2703, Delaware Avenue, Buffalo, N.Y., U.S.A.
- 1918 Young, John Henry, M.Sc. (Vict.), 58, Queensborough Gardens, Hyndland, Glasgow.
- 1888 *Young, Professor Sydney, D.Sc. (Lond.), B.Sc. (Manc.), Hon. Sc.D. (Dub. and Bris.), F.R.S., Trinity College, Dublin. [c. 1904-07 ; 11-14.]
- 1878 *Young, William Charles, Chemical Laboratories, 24, Aldgate, London, E. 1.
- 1898 *Young, William Maurice Gathorne, 43, Bridge Terrace, Doncaster. [c. 1909-12 ; 1918-21.]

Z

- 1920 Zilva, Sylvester Solomon, Ph.D. (Giessen), D.Sc. (Lond.), Lister Institute of Preventive Medicine, Chelsea Bridge Road, London, S.W. 1.

NUMBER OF FELLOWS. 1571

ASSOCIATES OF THE INSTITUTE OF CHEMISTRY
OF GREAT BRITAIN AND IRELAND.

A

- 1921 Abbott, Walter Edgar, A.R.C.Sc.I., 65, Hollybrook Road, Clontarf, Dublin.
- 1918 Acland, Lauchlan Henry Dyke, M.C., B.A. (Oxon.), 12, Queensberry Place, S. Kensington, London, S.W. 7.
- 1917 Acland, Theodore William Gull, B.A. (Cantab.), 19, Bryanston Square, London, W. 1.
- 1917 Adams, Charles Ambrose, B.Sc. (Lond.), 10, Christchurch Place, Christchurch Road, London, N.W. 3.
- 1919 Adams, Thomas Henry, 7, Douglas Street, Derby.
- 1921 Adams, William Roy Cecil Coode, B.Sc. (Lond.), 1, Eton Avenue, Hampstead, London, N.W. 3.
- 1920 Adan, Laurence Hay Watt, M.A., B.Sc. (Aberd.), Lea-rig, Cults, Aberdeenshire.
- 1917 Adye, John William, B.Sc. (Bris.), c/o The Mond Nickel Co., Ltd., Clydach, S.O., Glamorgan.
- 1921 Aeschlimann, John Alfred, B.A. (Cantab.), B.Sc. (Lond.), Central Laboratory, Shell Haven, Essex.
- 1919 Aitchison, Leslie, B.Sc. (Lond.), D.Met. (Sheff.), New Eldon Chambers, Cherry Street, Birmingham.
- 1920 Akehurst, Charles Henry, B.Sc. (Lond.), Ash Grove, Runtlings Lane, Ossett, Yorks.
- 1918 Albinson, John, B.Sc. (Vict.), 291, Peter Street, Macclesfield, Cheshire.
- 1918 Aldred, Harold, M.Sc. (Manc.), Davenport, Kelston Road, Whitchurch, Cardiff.
- 1920 Alexander, Thomas Stuart, B.Sc. (Manc.), The Grammar School, Brighton.
- 1918 Allan, David Lyall, B.Sc. (Liv.), Dynamite Factory, Modderfontein, Transvaal, South Africa.
- 1918 Allcott, Arnold, B.Sc. (Manc.), Secondary School, Woking.
- 1920 Allen, Frank Laurence, B.Sc. (Lond.), 300, Central Park Road, East Ham, London, E. 6.
- 1918 Allen, Frederick Thomas, M.Sc. (Dun.), M.A. (N.U.I.), Ramsey Grammar School, Huntingdon.
- 1920 Allen, Samuel, B.Sc. (Edin.) 321, Easter Road, Leith.
- 1920 Allibone, Bernard Charles, A.R.C.S., Chevet Lane, Sandal, Wakefield.
- 1918 Alpress, Charles Frederick, B.Sc. (Birm.), 6, Drayton Road, King's Heath, Birmingham.
- 1919 Alston, Richard Archibald, A.M.C.T., 4, Colley Street, Chester Road, Stretford, Manchester.

- 1920 Ames, William Melville, M.A., B.Sc. (Edin.), c/o Imrie, 22, Melville Terrace, Edinburgh.
- 1918 Amies, Edwin John, M.Sc., A.R.C.S. (Lond.), 26, Valentine Road, Blackley, Manchester.
- 1920 Anderson, Duncan Geddes, B.Sc. (Glas.), c/o Maclay, 990, Pollokshaws Road, Crossmyloof, Glasgow.
- 1920 Anderson, George James William, Dr. Ing. (Hanover), 2, Wickham Road, Brockley, London, S.E. 4.
- 1919 Anderson, John, M.A. (Glas.), B.A., B.Sc. (Lond.), Craigielee, Park Road, Hamilton, Scotland.
- 1917 Anderson, Lennox James, 35, Auckland Road, Ilford, Essex.
- 1921 Anderson, Leonard, M.Sc. (Leeds), 20, Melton Road, West Bridgford, Notts.
- 1919 Andrews, Albert Edward, Dover Lodge, 41, Wood Vale, Forest Hill, London, S.E. 23.
- 1918 Andrews, John, B.Sc. (Lond.), 4, Casimir Road, Harold's Cross, Dublin.
- 1918 Andrews, Lionel Conrad, B.Sc. (Lond.), Cressingham House, Carshalton, Surrey.
- 1902 Andrews, Samuel, B.Sc., A.R.C.S. (Lond.), H.M. Patent Office, Southampton Buildings, London, W.C. 2.
- 1919 Andrews, William Archibald, B.Sc. (Birm.), Faculty of Engineering, The University, Bristol.
- 1918 Applebee, Harry Charles, 509, Edge Lane, Droylsden, Manchester.
- 1920 Appleyard, Frederick Norman, 12, Cartwright Gardens, London, W.C. 1.
- 1919 Arnall, Francis, M.Sc. (Lond.), South-Western Polytechnic Institute, Chelsea, London, S.W. 3.
- 1921 Arnott, John, 14, Percy Street, Ibrox, Glasgow.
- 1919 Arthur, John Stanley, O.B.E., B.Sc. (Lond.), 2, Halsmere Road, Myatts Park, London, S.E. 5.
- 1920 Arthur, Robert Owen, B.Sc. (Wales), 14, Pembroke Road, Pudsey, Leeds.
- 1915 Arundel, Edgar, B.Sc. (Lond.), 19, Warren Road, Wanstead, London, E. 11.
- 1920 Asherson, Nehemiah, M.A. (Cape Town), B.A. (Cape of Good Hope), Rosemount, 7, Exeter Road, Brondesbury, London, N.W.
- 1917 Ashmore, Stanley Arthur, B.Sc. (Lond.), Ingle Nook, Middleborough Road, Coventry.
- 1919 Ashton, Miss Dorothy, B.Sc.Tech. (Manc.), 18, Winchester Avenue, Sedgley Park, Prestwich, Manchester.
- 1920 Aspland, Alfred Lees, B.Sc. (Viet.), c/o Messrs. John Chorlton & Sons, 69, Piccadilly, Manchester.
- 1902 Aston, Francis William, Tennaal House, Harborne, Birmingham.
- 1919 Aston, William George, 30, The Square, Ilford, Essex.
- 1917 Atkinson, Harford Montgomery, B.Sc. (Lond.), Ph.D. (Würzburg), City & Guilds Technical College, Leonard Street, London, E.C. 2.
- 1918 Atkinson, Harold, B.A. (Oxon.), 29, Greenhill Crescent, Harrow.
- 1918 Atkinson, Samuel Comber, B.Sc. (Lond.).

- 1918 Aubrey, Thomas Emrys, B.Sc. (Wales), Llansadwrn, Llanwrda, S. Wales.
- 1919 Auchinleck, Gilbert Graham, B.Sc. (McGill), Department of Agriculture, Southern District, Galle, Ceylon.
- 1919 Auger, William, B.Sc., A.R.C.S. (Lond.), 10, Chester Road, South Tottenham, London, N. 15.
- 1918 Ault, Wilfrid Beaumont, B.Sc. (Birm.), 383, City Road, Edgbaston, Birmingham.
- 1920 Austin, Charles Reuben, B.Sc.Tech. (Manc.), Metallurgy Department, University College, Mount Pleasant, Swansea.
- 1919 Austin, Samuel Sydney, B.Sc.Tech. (Vict.), A.M.C.T., 43, Delaunays Road, Crumpsall, Manchester.

B

- 1920 Bacharach, Alfred Louis, B.A. (Cantab.), 7, Belsize Park Gardens, Hampstead, London, N.W. 3.
- 1919 Bachrach, Roland, A.R.C.S., 20, Nanking Road, Shanghai.
- 1921 Backes, Joseph John Valentine, A.R.C.S., Messrs. Fuller's Ltd., Hammersmith, London, W. 6.
- 1919 Badger, Miss Louie Midgeley, B.Sc.Tech. (Manc.), *see* Sinnatt.
- 1917 Bagnall, Howard Henry, B.Sc. (Birm.), Ellesmere, 21, Crosbie Road, Harborne, Birmingham.
- 1917 Bagshaw, Walter Noël, B.Sc. (Lond.), 17, Hereford Road, Harrogate.
- 1919 Bailes, Henry, B.A. (Cantab.), 30, College Road, Clifton, Bristol.
- 1917 Bailey, Clement William, M.B.E., M.Sc. (Birm.).
- 1921 Bailey, Robert Arthur, B.Sc. (Liv.), 4, Warton Street, Bootle, Liverpool.
- 1917 Baillie, William Learmonth, 40, Dunvegan Road, Eltham, London, S.E. 9.
- 1918 Bainbridge, James Roland, M.Sc. (Manc.), The Research Department, The York Street Flax Spinning Co., Belfast.
- 1921 Bains, Leslie, B.A. (Cantab.), B.Sc. (Lond.), 5, Carlton Road, Stroud Green, London, N. 4.
- 1919 Baker, Arthur, Davenport Lodge, Pelham Road, Gravesend, Kent.
- 1921 Baker, Bertram Francis, 34, Chelmsford Road, Leytonstone, London, E. 11.
- 1919 Baker, Gerrard Wollaston, 3, Haling Park Road, South Croydon, Surrey.
- 1920 Balaban, Isidore Elkanah, B.Sc.Tech. (Manc.), 7, Devonshire Street, Higher Broughton, Manchester.
- 1918 Baldwin, Sam, M.B.E., M.Sc. (Vict.), Sandholme, St. George's Avenue, Dovercourt.
- 1918 Bales, Sidney Hartley, B.Sc. (Leeds), Glenholm, 338, High Road, Lee, London, S.E. 12.
- 1919 Balls, Ernest George, M.C., B.Sc. (Lond.), South End Green, Rushden, Buntingford, Herts.
- 1918 Barber, Charles Frederick Lee, 12, Queen's Terrace, Otley, York.

- 1920 Barber, Harold Hayden, B.Sc. (Lond.), 38, Vicarage Avenue, Derby.
- 1920 Barclay, Alexander, A.R.C.S., 13, Wellesley Mansions, West Kensington, London, W. 14.
- 1921 Barham, Ronald Jack, B.Sc. (Liv.), Derby Park, Oxford Road, Bootle, Liverpool.
- 1918 Barker, James Stanley, 70, Senior Street, Mold Green, Huddersfield.
- 1918 Barker, Matthew Felix, M.Sc. (Lond.), A.R.C.S., D.I.C., The Linen Industry Research Association, The Research Institute, Lambeg, Belfast.
- 1918 Barnes, Arthur Chapman, B.Sc. (Manc.), Chemical Research Department, P.O. Box 141, Nairobi, Kenya Colony, British East Africa.
- 1920 Barnett, Miss Amanda Mary Rossington, A.R.C.Sc.I., Beedom, Billingshurst, Sussex.
- 1918 Barnett, Walter Leigh, B.Sc. (Lond.), 14, Downing Street, Cambridge.
- 1918 Barr, James, B.Sc., A.R.C.S. (Lond.), The North British Chemical Co., Droylsden, Manchester.
- 1893 Barrett, William Steers, A.R.C.Sc.I., The College of Technology, Sackville Street, Manchester.
- 1919 Barrett, Ernest, B.Sc. (Lond.), 121, Algernon Road, Lewisham, London, S.E. 13.
- 1919 Barrett, Frank Leslie, 15, Russell Road, Whalley Range, Manchester.
- 1918 Barrett, John Douglas, B.Sc. (Leeds), The Line Cottage, Silkestone Common, nr. Barnsley.
- 1921 Barron, Richard James, A.R.C.Sc.I., Glen Cottage, Waterford, Ireland.
- 1918 Barrs, Charles Edward, 58, South Hill Park, Hampstead, London, N.W. 3.
- 1918 Bassett, Harold Llewelyn, M.A. (Cantab.), B.Sc. (Lond.), 33, Wellfield Road, Roath, Cardiff.
- 1913 Bartlett, Dorothy Jessie (*see* Storey).
- 1920 Bate, Philip James, A.R.C.S., 4, Station Parade, Sanderstead, Surrey.
- 1914 Bate, Stanley Charles, B.Sc. (London.), British Dyestuffs Corporation, Blackley, Manchester.
- 1919 Bateman, Alfred Harry, B.Sc. (Lond.), 24, Westcombe Park Road, Blackheath, London, S.E.
- 1920 Bates, Victor Edward Lionel, B.Sc. (Lond.), 397, Northampton Buildings, Clerkenwell, London, E.C. 1.
- 1921 Bausor, Harold William, M.A. (Cantab.), De Freville Lodge, De Freville Avenue, Cambridge.
- 1919 Bayley, Frank, M.Sc.Tech. (Manc.), 26, Birch Street, Rood End, East Oldbury, nr. Birmingham.
- 1921 Baylis, Miss Dorothy, B.Sc. (Liv.), 4, Sunnyside, Lightcliffe, nr. Halifax, Yorks.
- 1919 Bean, Philip Leslie, A.R.C.S., Glengariff, Ashburton Road, Croydon, Surrey.
- 1918 Beard, Edgar, B.Sc. (Edin.), c/o Forsyth, 5, Craighouse Terrace, Edinburgh.
- 1918 Bearder, Ernest Arthur, B.Sc. (Leeds), Stonegate, Highfield, Sale, Cheshire.

- 1918 Bearn, Joseph Gauld, M.Sc. (Manc.), 39, Selwyn Avenue, Richmond, Surrey.
- 1920 Becker, Frederick Oscar Pitt, A.R.C.S., 42, Victoria Avenue, Surbiton, Surrey.
- 1919 Becker, Henry Galvin, A.R.C.Sc.1., 15, York Road, Rathmines, Dublin.
- 1918 Beckinsale, Sydney, B.Sc. (Wales), 14, Bracken Avenue, Balham, London, S.W. 12.
- 1920 Beckley, Verey Alfred, B.A. (Cape of Good Hope), M.A. (Cantab.), Waverley, Belvedere, Kent.
- 1920 Beadle, Francis Charles, B.Sc. (Bris.), 5, Clift House Road, Ashton Gate, Bristol.
- 1919 Beesley, Darrell Webb, 380, Dickenson Road, Longsight, Manchester.
- 1917 Beesley, Richard Moore, M.C., M.Sc. (Manc.), c/o Cia Mexicana de Petroleo El Aguila, S.A., The Refinery, Minatitlan, V.C., Mexico.
- 1920 Beetlestone, Norris Charles, B.Sc. (Lond.), 101, Trent Valley Road, Lichfield, Staffs.
- 1921 Belasco, Harry George, B.Sc. (Lond.), 48, Thornton Avenue, Streatham Hill, London, S.W. 2.
- 1919 Bell, Herbert Dearman, Sewage Works, Burton Grange, Barnsley.
- 1921 Bell, James, B.A. (Dub.), 30, Trinity College, Dublin.
- 1919 Bell, James Horst Brunnemann, M.A., B.Sc. (Edin.), South Manse, Auchtermuchty, Fife.
- 1919 Bell, Thomas Robert, B.Sc. (Dun.), 2, Marine Crescent, Hartlepool, Yorks.
- 1919 Bell, Wilfred Andrews, 4, St. Michael's Terrace, Headingley, Leeds.
- 1918 Bennett, William Gordon, M.Sc. (Leeds), c/o Miss Cory, 70, North Road, Bloomfield, Belfast.
- 1918 Benson, Miss Margaret, M.Sc. (Manc.), 13, Bates Street, Longsight, Manchester.
- 1918 Bentley, Frank Thomas, B.Sc. (Birm.), 62, College Road, Moseley, Birmingham.
- 1919 Berends, Johann Friedrich, B.Sc. (Lond.), Rosefield Cottage, Ford Bridge Road, Ashford, Middlesex.
- 1919 Berry, Arthur George Vale, c/o Trinidad Leaseholds Ltd., Pointe à Pierre, Trinidad, B.W.I.
- 1918 Berry, Edgar, M.Sc. (Manc.), 41, King Edward Road, Gee Cross, Hyde, Cheshire.
- 1919 Berry, Robert Gordon, B.Sc. (Lond.), Cia Mexicana de Petroleo El Aguila, S.A., Tampico, Mexico.
- 1920 Berry, Walter Richard, B.Sc. (Manc.), 128, High Street, Chorlton-on-Medlock, Manchester.
- 1918 Bevan, Abram, B.Sc. (Wales), A.R.C.S., 11, Dingle Road, Penarth, Glam.
- 1918 Beynon, Edgar Mostyn, B.Sc. (Wales).
- 1918 Bickerstaffe Robert, c/o The Greenwich Inlaid Linoleum Co., Ltd., 74, Tunnel Avenue, East Greenwich, London, S.E. 3.

- 1917 Bickle, William Henry, B.Sc. (Lond.), 44, Cambridge Road, Lee, London, S.E. 12.
- 1919 Biffen, Frank Moody, B.Sc. (Lond.), 77, Albany Street, Regent's Park, London, N.W. 1.
- 1921 Biggs, Sidney Harold, B.Sc. (Lond.), 15a, Rockmount Road, Plumstead, London, S.E. 18.
- 1918 Billbrough, Sidney, B.Sc. (Lond.), The Gables, Knottingley, Yorks.
- 1920 Birch, Geoffrey Longworth, A.R.C.S., 6, Scarth Road, Barnes, London, S.W.
- 1918 Birchall, William, Ingledene, Green End Lane, St. Helens, Lanes.
- 1918 Bird, John Cecil, B.Sc. (Lond.), 75, Riffel Road, Willesden Green, London, N.W. 10.
- 1920 Bird, Reginald Robert, B.Sc. (Bris.), 217, Newport Road, Cardiff.
- 1921 Birkinshaw, John Howard, B.Sc. (Leeds), Maythorne, Ardrossan Road, Saltecoats, Ayrshire.
- 1921 Birkitt, Cyril Herbert, 21, Overdale Road, Derby.
- 1918 Birse, William Milne, M.A., B.Sc. (Aberd.), 40, Gray Street, Aberdeen.
- 1917 Bishop, Robert Odell, Department of Agriculture, Kuala Lumpur, F.M.S.
- 1917 Black, James Walter, B.Sc. (Lond.), Astref Refinerias de Tartaros, S.A., Rosendo Arus, 89, Barcelona, Sans, Spain.
- 1918 Blackburn, Rudolph Isaac, B.A. (Cantab.), B.Sc. (Lond.), 8, Dunlace Road, Clapton, London, E. 5.
- 1918 Blackler, Montague Bennett, Ph.D. (Würzburg), 8, Higham Station Avenue, South Chingford, London, E. 4.
- 1918 Blair, Ethelbert William, B.Sc. (Lond.), D.I.C., Newington, Parkstone Avenue, Parkstone, Dorset.
- 1919 Blair, James, B.Sc. (Leeds), Arrochar, 82, Bloomfield Avenue, Bath.
- 1921 Blake, Thomas Arthur, B.Sc. (Lond.), 59, Cartwright Gardens, London, W.C. 1.
- 1917 Blake-Wride, Douglas Herbert, M.Sc. (Lond.), The Ferns, 4, Wynell Road, Forest Hill, London, S.E. 23.
- 1918 Blakey, George Alfred, 20, Saltburn Place, Bradford.
- 1919 Blakey, Walter, 569, London Road, Oakhill, Stoke-on-Trent.
- 1921 Blane, Edward Richardson, A.M.C.T., 10, Wright Street, Chorlton-on-Medlock, Manchester.
- 1918 Blatchford, Alfred Samuel, M.Sc. (Dun.), 31, Queen's Road, Hull.
- 1920 Bloom, Edward, B.Sc. (Lond.), 15, Lilybank Place, Aberdeen.
- 1920 Boardman, William, c/o Messrs. William Blythe & Co., Church, Lanes.
- 1918 Boas, Isaac Herbert, B.Sc. (Adelaide), M.Sc. (Perth), c/o Messrs. Michaelis, Hallenstein & Co., Lonsdale Street, Melbourne, Victoria, Australia.
- 1895 Bodey, Augustus Charles, B.Sc. (Lond.), 56, Beecroft Road, Brockley, London, S.E. 4.
- 1920 Bolton, Edward William, A.R.C.S., St. Ives, Dollis Park, Finchley, London, N. 3.

- 1919 Bolton, Harold Samuel, 30, Woodside, Wimbledon, London, S.W. 19.
- 1921 Bonnell, Miss Jane, B.Sc.(Wales), Glan Rhyd, Pwll, Llanelly, Carm.
- 1921 Bonnicksen, Cyril Wilfred, B.Sc. (Lond.), c/o Messrs. Lockett Bros., & Co., Casilla No. 721, Iquiqui, Chile.
- 1917 Boorman, Harry George Trench, The Hollies, Victoria Park, Herne Bay.
- 1921 Booth, Alfred Lawrance, A.M.S.T., 3, The Polygon, Lower Broughton, Manchester.
- 1919 Booth, Thomas, M.Sc. (Vict.), The Technical Institute, Old Trafford, Manchester.
- 1921 Bosman, Louis Pierre, B.A. (Cape), B.Sc. (Edin.), 14, Buecleuch Place, Edinburgh.
- 1917 Bostock, Bertram Ravenscroft, M.Sc.Techn. (Mane.), Winnington Mount, Northwich, Cheshire.
- 1918 Bosworth, Captain Stewart MacGregor, B.Sc. (Lond.), 56, Coventry Road, Bedworth, Nuneaton.
- 1919 Bousfield, Edward Alexander Robert, B.Sc. (Lond.), Montrose, 49, Fontenoy Road, Balham, London, S.W. 12.
- 1917 Bowack, Douglas Anderson, 1, Park View, Wellington Road, Cork, Ireland.
- 1917 Bowden, Richard Charles, M.Sc. (Bris.), 2, Totteridge Road, Enfield Wash, Middlesex.
- 1921 Bowen, Arthur Riley, B.Sc. (Birm.), 63, Bromyard Road, Worcester.
- 1920 Bowman, Stanley, Meadhurst, Sunbury-on-Thames.
- 1918 Bowyer, Arthur Stewart, M.Sc. (Mane.), The Woodlands, Chelford, Cheshire.
- 1918 Boyd, William John, B.Sc. (Glas.), 73, Manse Street, Saltcoats, Ayrshire.
- 1921 Boyes, George Richardson, 61, Balham Hill, London, S.W. 12.
- 1918 Bracher, André, c/o United Dairies (Wholesale) Ltd., Newport, Salop.
- 1918 Bradley, George William James, 13, Park Road, Ebbw Vale, Mon.
- 1919 Bradshaw, John, M.Sc (Vict.), 40, Grange Street, Bare, Morecambe.
- 1919 Braid, Kenneth William, B.Sc., B.Sc. Agric., (Aberd.), B.A. (Cantab.), Ellerslie, Cults, Aberdeenshire.
- 1919 Bramer, John Douglas Stacey, Wellcome Club, Dartford, Kent.
- 1917 Branson, Frederick Hartridge, Northview, West Park Grove, Park Lane, Roundhay, Leeds,
- 1920 Branson, Victor Cecil, M.C., A.R.C.S. (Lond.), Naparima Oilfields, Ltd., San Fernando, Trinidad.
- 1919 Brash, William, B.Sc., A.R.C.S. (Lond.), 18a, Belmont Park, Blackheath, London, S.E. 3.
- 1918 Braunholtz, Walter Theodore Karl, B.A. (Cantab.), Goslar, Adams Road, Cambridge.
- 1917 Bray, Geoffrey Trelawney, 3, Milton Road, Highgate, London, N. 6.
- 1917 Brazier, Sidney Albert, M.Sc. (Birm.), 1, New Buildings, Kingsbury Road, Tyburn, Birmingham.
- 1918 Brekke, Lorentz Oliver, B.Sc. (Leeds), 193, Coltman Street, Hull.

- 1918 Brennan, Arthur, B.Sc. (Dun.), Technical Institute, Newport, Mon.
- 1921 Breslin, John James, A.R.C.Sc.I., 40, Clarendon Street, Derry.
- 1918 Bride, Cyril, M.A. (Oxon.), B.Sc. (Lond.), Templetown Ovens, Consett Iron Co., Consett, Co., Durham.
- 1918 Bridge, Fred, A.R.C.S., c/o Messrs. W. A. Ward & Co., Ltd., Kent Street, Nottingham.
- 1919 Brierley, Joseph, B.Sc., B.Comm. (Manc.), 13, Kershaw Street, Failsworth, Manchester,
- 1919 Briggs, Dennis Brook, B.A. (Cantab.), Bradfield College, nr. Reading, Berks.
- 1917 Brimley, John Edmund, B.Sc. (Lond.), 2a, The Leas, Westcliff-on-Sea, Essex.
- 1920 Briscoe, Myer, B.Sc. (Lond.), 24, Morley Road, Twickenham, Middlesex.
- 1918 Brittain, Arthur, M.Sc. (Liv.), 44, Albert Street, Eccles, Manchester.
- 1917 Brittain, Charles Edward, B.A. (Lond.), M.Sc. (Vict. and Leeds), The Grammar School, Normanton, Yorks.
- 1919 Britton, Hubert Thomas Stanley, B.Sc. (Bris.), Flat 2, 8, Cranworth Gardens, Brixton, London, S.W. 9.
- 1917 Broadhurst, Harold Marland, B.Sc.Tech. (Manc.), 5, Western Drive, Grassendale, Liverpool.
- 1919 Brodie, Neal, M.Sc. (Dun.), 30, Judges Court Road, Alipore, Calcutta.
- 1920 Bromley, Ralph Frederick, B.Sc. (Lond.), 13, Winsor Road, Forest Gate, London, E. 7.
- 1917 Brookman, Richard Theodore, B.Sc. (Lond.), Dronley, Woodside Park Road, North Finchley, London, N. 12.
- 1921 Brown, Andrew Charles, 26, Springvale Place, Saltecoats, Ayrshire.
- 1918 Brown, Hugh Browning.
- 1918 Brown, Ivor Vernon, B.Sc. (Wales).
- 1921 Brown, Joseph Patrick, B.Sc. (Vict.), Brackley Villa, Little Hulton, Bolton, Lancs.
- 1921 Brown, Leslie Gilbert, A.C.G.I., 6, Airlie Gardens, Ilford, Essex.
- 1919 Brown, Leslie Norman, M.A. (Oxon), A.R.C.S., Aberdour House, Beaconsfield Avenue, Dover.
- 1918 Brown, Robert Lidwill, A.R.C.Sc.I., 69, Paulet Road, Camberwell, London, S.E. 5.
- 1920 Browne, Miss Agnes, B.Sc. (Lond.), A.R.C.Sc.I., 18, West Side, Clapham Common, London, S.W. 4.
- 1919 Browne, Walter Lord, B.Sc. (Leeds), Kininnie, Kirkton Road, Burntisland, Fife.
- 1918 Browning, Henry, junr., M.Sc. (Manc.), c/o The Rectory, Beswick, S.E. Manchester.
- 1917 Brownson, Thomas Kerfoot, B.A. (Cantab.), B.Sc. (Manc.), 19, Priory Gardens, Highgate, London, N. 6.
- 1919 Bruce, Alexander, B.Sc. (Edin.), The National Provincial and Union Bank of England, Ltd., 208, Piccadilly, London, W. 1.
- 1918 Bruce, John Ronald, M.Sc. (Liv.), Marine Biological Station, Port Erin, Isle of Man.

- 1918 Bruce, Robert James, c/o The Greenwich*Inlaid Linoleum Co., Ltd., 74, Tunnel Avenue, Greenwich, London, S.E. 10.
- 1918 Brunyee, Thomas Herbert, B.Sc. (Sheff.), Penketh School, nr. Warrington, Lanes.
- 1918 Bryant, Charles Sidney, B.A. (Oxon.), B.Sc. (Lond.), Research Department, Royal Arsenal, Woolwich, London, S.E. 18.
- 1920 Buck, Johannes Sybrandt, B.Sc. (Liv.), 40, Falkland Road, Egremont, Cheshire.
- 1919 Bull, Bertram Alfred, 14, North Road, West Bridgford, Nottingham.
- 1919 Bull, Frank Henry Charles, B.Sc. (Bris.), 75, North Road, St. Andrews, Bristol.
- 1917 Bull, Philip Cecil, D.S.O., A.R.C.S., 33, Queen's Gate, London, S.W. 7.
- 1920 Bullen, John James Curno, c/o The Demerara Co., Ltd., Plantation Diamond, nr. Georgetown, Demerara.
- 1918 Bult, Herbert John, 63, Addiscombe Road, Croydon, Surrey.
- 1917 Bunbury, Hugh Mills, B.Sc. (Lond.), M.Sc. (Bris.), Dudley Lodge, Bury New Road, Prestwich, Manchester.
- 1919 Buncce, Albyn, c/o Messrs. Cannington Shaw & Co., Ltd., Sherdley Works, St. Helens, Lanes.
- 1919 Bunting, Henry Herbert, Oficina de Ensayes, The Peruvian Corporation, Ltd., Callao, Peru.
- 1917 Burbridge, Walter Norman, 6, Sunnysdale Gardens, Mill Hill, London, N.W. 7.
- 1921 Burdett, Miss Frances, B.Sc. (Wales), The Technical College, Bradford.
- 1920 Burgess, Henry, M.Sc. (Birm.), Calverhall, Whitechurch, Salop.
- 1918 Burgess, William Ernest, B.Sc. (Vict. and Leeds), 30, Springdale Avenue, Huddersfield, Yorks.
- 1920 Burnett, Robert Alexander, M.A., B.Sc. (Aberd.), 7, Roseneath Terrace, Edinburgh.
- 1920 Burns, Alan Chamley, M.Sc.Tech. (Manc.), Cotton Research Board, Ministry of Agriculture, Giza (Mudiriya), near Cairo, Egypt.
- 1917 Burr, Alfred Hamilton, M.A., B.Sc. (Aberd.), c/o Mrs. Crawford, 13, Dover Street, Chorlton-on-Medlock, Manchester.
- 1920 Burrell, Wilkinson William, M.Sc. (Manc.), Bank House, Colne Bridge, Huddersfield.
- 1918 Burrows, Edward Lister, Technical School, Leicester.
- 1917 Burton, Donald, M.B.E., M.Sc. (Leeds), Holmesfield, High Street, Morley, near Leeds.
- 1891 Burton, Joseph.
- 1917 Burwell, Robert Parmenter, 92, Southtown Road, Great Yarmouth.
- 1919 Bury, Charles Rugeley, B.A., B.Sc. (Oxon), Ellfield, Wotton-under-Edge, Gloucestershire.
- 1918 Butler, Raymond Renard, B.Sc. (Lond.), 55, Seymour Road, Haringay, London, N. 4.
- 1917 Butler-Jones, Frank, B.A. (Cantab.), 124, Inderwick Road, Crouch End, London, N. 8.

- 1918 Butterworth, John Pilling, B.Sc. (Manc.), Pond House, Wakefield Road, Huddersfield.
- 1917 Byles, John Edward, B.Sc. (Manc.), The Government Laboratory, Clement's Inn Passage, Strand, London, W.C. 2.
- 1921 Byron, John Percy, 68, Mount Pleasant Road, Exeter.

C

- 1918 Cabell, Harold Frank, B.Sc. (Lond.), 163, Clonmore Street, Southfields, London, S.W. 18.
- 1921 Cadman, William Henry, B.Sc. (Wales), Agricultural College, Giza, Egypt.
- 1918 Caird, Miss Ella, *see* Corfield.
- 1918 Calam, Percy, B.Sc., A.R.C.S. (Lond.), 150, Woodside Road, Lockwood, Huddersfield.
- 1920 Callendar, Leslie Hugh, A.R.C.S., 49, Grange Road, Ealing, London, W. 5.
- 1917 Callister, Cyril Percy, M.Sc. (Melbourne), Annondale, Lockwood Avenue, North Brighton, Victoria, Australia.
- 1921 Callow, Ernest Harold, B.Sc. (Birm.), 55, Evelyn Road, Sparkhill, Birmingham.
- 1918 Callow, Raphael Heber, M.Sc. (Liv.), 16, Breck Road, Anfield, Liverpool.
- 1921 Cammack, Walter, B.Sc. (Lond.), Durley Grange, South Benfleet, Essex.
- 1921 Campbell, Alan Newton, B.Sc. (Lond.), 33, Micheldever Road, Lee, London, S.E. 12.
- 1919 Campbell, John, A.R.T.C., Ph.D. (Mass.), c/o Asbestos Wood Co., Nashua, New Hampshire, U.S.A.
- 1918 Cant, Thomas, M.A. (Glas.), B.Sc. (Lond.), Norwood, Bathgate, Scotland.
- 1919 Card, Stanley Walter, B.Sc. (Lond.), Clawbonny, Jordan Road, Four Oaks, Warwickshire.
- 1918 Cardell, Ivor Southwell, M.Sc. (Wales), 5, Whitechurch Road, Cardiff.
- 1917 Carpenter, Charles William, M.Sc.Tech. (Manc.), 110, Mottram Road, Broadbottom, near Manchester.
- 1919 Carpenter, George Kingsford, B.A. (T.C.D.), 51, Grosvenor Road, Rathmines, Dublin.
- 1919 Carpenter, Leonard, B.Sc. (Lond.), 143, Palmerston Road, Bowes Park, London, N. 22.
- 1917 Carter, Sydney Raymond, M.Sc. (Birm.), The University, Birmingham.
- 1920 Cashmore, Albert Eric, B.Sc. (Birm.), Gladstone Road, Dorridge, near Birmingham.
- 1917 Casson, Simon B., B.Sc.Tech. (Manc.), 188, Elizabeth Street, Hightown, Manchester.
- 1917 Caunce, Albert Edward, M.Sc. (Liv.), c/o MacDougall, 88, Langside Avenue, Langside, Glasgow.
- 1918 Cauwood, John Douglas, M.Sc. (Sheff.), 40, Hampton Road, Pitsmoor, Sheffield.
- 1918 Chadwick, Robert Bertram, B.Sc.Tech. (Manc.), 3, Dudley Terrace, Leith, Edinburgh.

- 1918 Chadwick, Samuel, M.Sc. (Manc.), 84, Prince Street, Rochdale, Lanes.
- 1920 Chalmers, Frederick Grant Duncan, M.A., B.Sc. (Aberd.), 20, Birchfield Road, Six Ways, Birmingham.
- 1918 Chambres, Rev. Gordon Crewe, M.A. (Oxon), The Grammar School, Wigan.
- 1920 Chapman, Arthur William, B.Sc., A.R.C.S. (Lond.), Y.M.C.A. Settlement, Oxford Street, Sheffield.
- 1921 Chapman, Cecil, 30, Princes Road, Middlesbrough.
- 1919 Chappel, Edgar John, 6, Khedive Road, Forest Gate, London, E. 7.
- 1918 Charlton, James, B.Sc. (Vict.), 62, Ainsdale Road, Bolton, Lanes.
- 1917 Charlwood, Ernest William Arthur, B.Sc. (Lond.), Oakleigh, 86, Bencham Lane, West Croydon, Surrey.
- 1918 Chatt, Miss Eileen Mary, B.Sc. (Lond.), 95, South Hill Park, Hampstead, London, N.W. 3.
- 1920 Chaudhuri, Tarini Charan, M.A. (Calcutta), Krishnath College, Berhampur, Bengal, India.
- 1918 Chaumeton, Philibert Camille, B.Sc. (Leeds), Messrs. Duroglass Ltd., 40-43, Norfolk Street, Strand, London, W.C. 2.
- 1920 Cheeseright, Lionel Sidney, M.C., B.Sc. (Dun.), 40, Sherlum Terrace, Consett, Co. Durham.
- 1919 Cheshire, Daniel, c/o Messrs. G. & W. N. Hicking, Queen's Road Works, Nottingham.
- 1920 Chibnall, Albert Charles, M.A. (Cantab.), Cedar House, Chiswick Mall, London, W. 4.
- 1919 Chick, Oliver, 31, Auckland Road, Cranbrook Park, Ilford, Essex.
- 1919 Child, Arthur James, B.Sc. (Lond.), Oaklands, Edgware, Middlesex.
- 1919 Childs, Hugh, B.Sc. (Vict.), Norton, North Road, Grassendale Park, Liverpool.
- 1917 China, Frederick John Edwin, B.Sc. (Lond.), c/o Messrs. Burt, Boulton, and Haywood, Ltd., Prince Regent's Wharf, Silvertown, London, E. 16.
- 1919 Chitty, Edward Charles, M.C., 143, Devonshire Road, Forest Hill, London, S.E. 23.
- 1918 Choate, Matthew Francis Stephen, B.Sc. (Dun.), Gorsefield, Patrieroft, Manchester.
- 1917 Chorley, Percy, M.Sc. (Manc.), c/o British Dyestuffs Corporation, Ltd., Blackley, Manchester.
- 1912 Chown, Clement Richard, B.Sc., A.R.C.S. (Lond.), 50, Craven Avenue, Ealing, London, W. 5.
- 1917 Christelow, Joseph William, B.Sc. (Lond.), 86, Manley Road, Whalley Range, Manchester.
- 1921 Christie, George Hallatt, B.Sc. (Sheff.), 155, Sharrow Vale Road, Sheffield.
- 1918 Clark, Arthur Herbert, B.Sc. (Birm.), The Poplars, Lovely Lane, Warrington.
- 1918 Clark, Arthur Stanley, B.Sc. (Lond.), 15, Holly Road, Edgbaston, Birmingham.

- 1919 Clark, Cecil Henry Douglas, B.Sc., A.R.C.S. (Lond.), Narbonne House, 71, Narbonne Avenue, Clapham Common, London, S.W. 4.
- 1918 Clark, Francis William, B.Sc. (Lond.), 20, Methley Mount, Chapel Allerton, Leeds.
- 1918 Clark, Leslie Melville, Pradelle, Preston Road, near Harrow.
- 1917 Clark, Robert, c/o Shaw, 23, Herriet Street, Pollokshields, Glasgow.
- 1915 Clark, Walter Sydney, A.C.G.I., 81, George Street, Luton, Beds.
- 1918 Clarke, Frederick George, B.Sc. (Lond.), 27, Ashlone Road, Putney, London, S.W. 15.
- 1918 Clarke, Herbert Edmund, M.A., B.Sc. (Oxon), 4, Selborne Avenue, Low Fell, Gateshead.
- 1920 Clarke, John George, M.A., B.Sc. (St. Andrews), c/o Messrs. Albright & Wilson, Ltd., Oldbury, Birmingham.
- 1921 Clatworthy, Miss Joan Catherine, A.C.G.F.C., 6, Beverley Road, Highams Park, Chingford, London, E. 4.
- 1921 Clayton, Herbert, B.A. (Oxon), 75, Thornbury Drive, Bradford, Yorks.
- 1918 Clayton, William, M.Sc. (Liv.), 162, North Hill Street, Liverpool.
- 1918 Clements, John Arthur, The Quintas, Spital, Chesterfield.
- 1918 Clifford, Joseph, A.R.C.Sc.I., The Government Analytical Laboratory, Cairo, Egypt.
- 1918 Clifford, Percy Herbert, B.Sc. (Lond.), The Acacias, Hillingdon, Middlesex.
- 1919 Clifford, Sydney George, 51, Peak Hill, Sydenham, London, S.E. 26.
- 1917 Clotworthy, Harold Reginald Septimus, M.A. (Dub.), A.R.C.Sc.I., B.Sc. (Lond.), Cossington, Alder Road, Sidcup, Kent.
- 1920 Clucas, Alfred Henry, 33, Victoria Road, Headingley, Leeds.
- 1920 Clulow, Frederick Stanley, B.Sc., A.R.C.S. (Lond.), c/o Shell-Mex, Ltd., Shell Haven, Thames Haven, Essex.
- 1918 Coakill, Edgar Alfred, Ramore, Littleover Lane, Normanton, Derby.
- 1919 Cochrane, John Robert Swan, B.Sc. (Melbourne), Cordite Factory, Maribyrnong, Victoria, Australia.
- 1918 Cockram, Leslie, B.Sc. (Vict.), Stanley Road, Knutsford, Cheshire.
- 1920 Cocks, Leslie Victor, Tara, Highfield Road, Rock Ferry, Cheshire.
- 1919 Cockshutt, John Albert, M.Sc. (Manc.), St. Ann's, Prestbury Road, Cheltenham.
- 1921 Coffey, Samuel, B.Sc. (Lond.), 67, Palin Street, Hyson Green, Nottingham.
- 1920 Cohen, Abraham, B.Sc. (Lond.), Cardogan House, 296, Old Ford Road, Victoria Park, London, E. 3.
- 1917 Colclough, Tom Peach, M.Sc. (Manc.), B.Met. (Sheff.), c/o Park Gate Iron & Steel Co., Rotherham, Yorks.
- 1918 Coles, Leonard Arthur, B.Sc. (Lond.), Ludlow House, Wakefield Road, Huddersfield.
- 1919 Colles, William Morris, B.Sc. (Lond.), Turf Club, Cairo, Egypt.
- 1920 Collier, James Luke, A.R.C.S. 88a, Holland Road, Kensington, London, W. 14.

- 1917 Collins, Bert Amos, B.Sc. (Birm.), Graisleys Lane, Wednesfield, Wolverhampton.
- 1919 Comber, Norman Mederson, B.Sc., A.R.C.S. (Lond.), Department of Agriculture, The University, Leeds.
- 1919 Condrup, Carl Oscar, A.R.C.S., B.Sc. (Lond.), Wykeham, Hill View Road, Woking.
- 1918 Cook, Sidney Jabez, B.A. (Toronto), Dominion Bureau of Statistics, Ottawa, Ontario, Canada.
- 1921 Cooke, Frank, 25, Western Hill, Sunderland.
- 1917 Cooke, John Harbourne, B.A. (Dub.), A.R.C.Sc.I., 9, Cintra Park, Upper Norwood, London, S.E. 19.
- 1918 Coombs, Lewis Newton, B.Sc. (Lond.), Lockerley, Romsey, Hants.
- 1918 Coomes, Arthur Nelms, Fairview, Shrewsbury Lane, Shooters Hill, London, S.E. 18.
- 1920 Cooper, Cecil Hamer, B.Sc. (Manc.), c/o The Calico Printers Association, South Arthurlie Print Works, Barrhead.
- 1917 Cooper, Christopher, M.Sc. (Dun.), 25, Appletree Gardens, Walkerville, Newcastle-on-Tyne.
- 1897 Cooper, William Ranson, M.A., B.Sc. (R.U.I.), A.C.G.I., 82, Victoria Street, London, S.W. 1.
- 1919 Cooper, William Suddaby, B.Sc. (Lond.), 29, Glencoe Street, Hull.
- 1917 Coppin, Noël Guilbert Stevenson, M.Sc. (Liv.), Southbank, Chapel Lane, Frodsham, nr. Warrington.
- 1917 Corelli, Octavian Julius, Ph.D. (Zürich), Umballa, Worcester Park, Surrey.
- 1918 Corfield, Mrs. Ella, 12, Fitzjohn Avenue, Barnet, Herts.
- 1918 Cory, Harold Edward John, M.Sc.Tech. (Manc.), Kenwood, Longlands Park Road, Sidecup, Kent.
- 1917 Cottrall, Leslie George, B.Sc. (Lond.), Roseneath, Swanley Village, Kent.
- 1918 Couch, Daniel Little, Blackshotts Lodge, Little Thurrock, Grays, Essex.
- 1919 Coupe, Geoffrey, Messrs. F. N. Pickett et Fils, Dannes, par Neufchatel, P. de C., France.
- 1919 Course, Herbert Edwin, Water Works, Gold Coast Colony, W. Africa.
- 1917 Cousen, Arnold, B.Sc., A.R.C.S., (Lond.), Department of Glass Technology, Sheffield.
- 1918 Cousins, Francis George, D.C.M., B.Sc. (Lond.), 75, Richmond Road, Montpellier, Bristol.
- 1920 Coutie, Alexander, B.Sc. (Edin.), 4, Priestfield Road, Edinburgh.
- 1918 Cowie, George Alston, M.A., B.Sc. (Aberd.), 49, Woodstock Avenue, Golders Green, London, N.W. 4.
- 1906 Cowie, Thomas Field, B.Sc. (Edin.), 62, Eglinton Road, Ardrossan, Ayrshire.
- 1919 Cowper, Alfred Denys, M.Sc. (Alberta), 61½, Quentin Road, Blackheath, London, S.E. 13.
- 1918 Crabtree, Herbert Grace, M.Sc. (Liv.), Dyeing Department, The University, Leeds.
- 1917 Crabtree, John Wallace, M.Sc. (Manc.), Greenbank, 9, Yates Street, N.S., Blackpool.


- 1918 Craig, Robert, Benmore, Bromborough, Cheshire.
- 1918 Cramer, Barnett Joseph, M.Sc.Tech. (Manc.), c/o The Straits Trading Co., Ltd., Butterworth, Penang, Straits Settlements.
- 1919 Crann, Thomas William, M.Sc. (Leeds), 17, Morritt Drive, Halton, nr. Leeds.
- 1919 Cranston, John Arnold, B.Sc. (Glas.), 453, Albert Road, Langside, Glasgow.
- 1920 Craven, Mrs. May Badger, M.Sc.Tech. (Manc.), 10, Birch Grove, Rusholme, Manchester.
- 1919 Craven, Reginald, A.R.C.S., c/o Professor Maitland, D.Sc., Robert Gordon's Technical College, Aberdeen.
- 1918 Craven, William Henry, B.Sc. (Lond.), Department of Chemistry, Heriot-Watt College, Edinburgh.
- 1910 Crawford, Frederick Alexander Ferrier, B.A. (Dub.), Auldmuir, Argyle Road, Saltcoats, Ayrshire.
- 1920 Cray, Frank Maurice, B.Sc. (Lond.), 36, Thorney Hedge Road, Gunnersbury, London, W. 4.
- 1917 Cremer, Herbert William, B.Sc. (Lond.), Preston Lea, Faversham, Kent.
- 1918 Crews, Sidney Kirby, 11, Woodbury Park Road, Ealing, London, W. 13.
- 1919 Crisp, Douglas Edward, B.Sc. (Lond.), Messrs. Edward Crisp, Ltd., Cumbergate, Peterborough.
- 1918 Crockatt, Arthur John, M.Sc. (Leeds), Shandon, West Park Grove, Roundhay, Leeds.
- 1919 Crofts, Harold, M.Sc., (Dun.), Myrtle Grove, Penwortham, Preston.
- 1919 Cronshaw, Harry Brennan, B.A. (Cantab.), Ph.D. (Munich), A.R.S.M., Technical Institute, Brierley Hill, Staffs.
- 1918 Crook, Sydney Edwin.
- 1917 Cross, Samuel Moses, A.R.C.Sc.I., 25, George Street, Cheetham Hill, Manchester.
- 1913 Crosse, Frederick George, 78, Hatton Garden, London, E.C. 1.
- 1917 Crow, Alexander, B.Sc. (Lond.), 209, Harlesden Road, Willesden Green, London, N.W. 10.
- 1918 Crowther, Edward Mortimer, M.Sc. (Leeds), 2, Wordsworth Road, Harpenden, Herts.
- 1917 Crowther, Horace Leslie, M.Sc. (Birm.), The Beeches, West Bromwich, Staffs.
- 1920 Crowther, Raymond Edwin, A.M.S.T., 5, Meadow Way, Wealdstone, Middlesex.
- 1918 Crundall, Sydney Francis William, A.C.G.F.C., c/o Messrs. Peter Spence & Sons, Ltd., Farnworth, nr. Widnes, Lanes.
- 1920 Cuckney, John, M.A. (Cantab.), High School, Newcastle, Staffs.
- 1919 Cullinane, Nicholas M., M.Sc. (Dub.), 27, Michael Street, Waterford, Ireland.
- 1917 Cumming, William Murdoch, B.Sc. (Glas.), 31, Mossgiel Road, Newlands, Glasgow.
- 1919 Cunningham, Henry Joseph, B.Sc. (Liv.), 325, Vauxhall Road, Liverpool.

- 1921 Curtin, Norman Richard Mary de Verdon, A.R.C.Se.I., 29, Grove Park, Rathmines, Dublin.
- 1917 Curtis, Raymond, M.Sc. (Sheff.), Sixth House, Hazelbottom Road, Crumpsall, Manchester.
- 1919 Curwen, Maurice Deloisne, B.Sc. (Lond.), c/o Compania Mexicana de Petroleo El Aguila, Minatitlan, Vera Cruz, Mexico.
- 1919 Cutter, John Outram, B.Sc. (Wales), 4, Abbey Road, Cambridge.

D

- 1920 Dakers, Robert Gillies Muir, c/o Wightman, 10, Steels Road, Edinburgh.
- 1919 Dalton, John, M.C., c/o Messrs. R. S. Watson & Co., Analytical Department, 16, Nanking Road, Shanghai.
- 1918 Daly, Arthur John, B.Sc. (Lond.), 21, Princess Road, Borrowash, Derby.
- 1919 Damon, William Aethelbert, B.Sc. (Birm.), 17a, Kidbrooke Park Road, Blackheath, London, S.E. 3.
- 1919 Dancaster, Ernest Augustus, B.Sc. (Lond.), Pleasant View, 101, Merton Hall Road, Wimbledon, London, S.W. 19.
- 1920 Daniels, Richard George, B.Sc., A.R.C.S., (Lond.), 5, Peterborough Villas, Fulham, London, S.W. 6.
- 1918 Dargie, Andrew, B.Sc. (St. Andrews), 140, Perth Road, Dundee.
- 1920 Darke, Wilfred Frederick, B.Sc. (Bris.), 10, Whiteladies Road, Clifton, Bristol.
- 1920 Davies, Cecil Whitfield, B.Sc. (Wales), Trewylan, Copers Copo Road, Beckenham, Kent.
- 1919 Davies, James Henry, Messrs. P. Lumt & Co., 37/47, Hornby Street, Liverpool.
- 1917 Davies, Richard Owen, B.Sc. (Wales), Idris Villa, Portland Street, Aberystwyth.
- 1919 Davies, Thomas, B.Sc. (Wales), 6, Castle Terrace, Haverfordwest.
- 1918 Davies, Thomas Ellis, M.A. (Oxon.), Bryn Ial, Rhosddu, Wrexham, N. Wales.
- 1918 Davies, Thomas Eynon, B.Sc. (Wales), 11, Herbert Street, Aberdare.
- 1920 Davies, Thomas Ifor, B.Sc. (Wales), 105a, Central Avenue, Gretna Green.
- 1918 Davis, William Eynon, B.Sc. (Wales), 1, Peterborough Road, Fulham, London, S.W. 6.
- 1918 Davies, William Morley, B.Sc. (Birm.), Folley, Lydbury North, Shropshire.
- 1921 Davis, Stephen Barton, M.Sc. (Liv.), 94, Hartington Road, Sefton Park, Liverpool.
- 1917 Davison, William, B.Sc. (Lond.), 25a, Hervey Road, Blackheath, London, S.E. 3.
- 1920 Dawkins, Alfred Ernest, B.Sc. (Adelaide), Australia House, Strand, London, W.C. 2.
- 1921 Dawkins, David Richard, B.Sc. (Wales), Llwyncelyn, Wern Road, Skewen, near Neath.

- 1920 Dawn, Thomas Sydney, A.R.C.S. (Lond.), 21, Belsize Square, London, N.W. 3.
- 1918 Dawson, James Muirie, Dunlop Rubber Co., Ltd., Kobe, Japan.
- 1917 Dawson Reginald David, B.Sc. (Aberd.), 49, Vernham Road, Plumstead, London, S.E. 18.
- 1919 Dawson, Stanley Ernest, A.M.C.T., The Cottage, Frewland Avenue, Davenport, Stockport.
- 1919 Day, James Nelson Edmund, B.Sc., A.R.C.S. (Lond.), Sunnysdene, Upper Lattimore Road, St. Albans, Herts.
- 1918 Dean, Harry Fitz-Gibbon, M.Sc. (Bris.), 57, Ashley Road, Bristol.
- 1921 Deering, Ernest Charles, B.Sc. (Lond.), 7, Graeme Road, Baker Street, Enfield.
- 1919 Dehn, Frank Bernard, Ph.D. (Jena), M.Sc. (Manc.), 53, Doughty Street, London, W.C. 1.
- 1918 Denbigh, George James, M.Sc. (Leeds), Medlock House, Oxford Street, Workington.
- 1920 Dent, James Harry, 25, Dover Street, Crumpsall, Manchester.
- 1920 Denton, John, Messrs. Denton Bros., Keighley Dyeworks, Keighley, Yorks.
- 1918 Dewar, George, 14, James Street, Falkirk.
- 1920 Dey, Manik Lal, M.Sc., (Calcutta,) 4, Beadon Street, Calcutta, India.
- 1918 Dick, James Scott, M.B.E., B.Sc. (St. Andrews), 6, Blendon Terrace, Plumstead, London, S.E. 18.
- 1920 Dickinson, Ernest, B.Sc., A.R.C.S. (Lond.), 2, Cliffe Terrace, Hainworth Wood Road, Keighley, Yorks.
- 1918 Dingley, Cyril Stanley, Hill Court, Fladbury, Worcestershire.
- 1914 Dingwall, Andrew, Dominion Grain Research Laboratory, Postal Station, "B," Winnipeg, Manitoba, Canada.
- 1920 Dixon, Bertram Eastwood, A.C.G.F.C., 4, Gunton Road, Upper Clapton, London. E. 5.
- 1918 Dixon, Norman, A.M.S.T., 17, Wilson Street, Gorse Hill, Stretford, Lanes.
- 1918 Dodd, Alfred Herbert, B.A. (Cantab.). The Department of Agriculture, The University. Leeds.
- 1921 Dodds, Herbert Henry, M.Sc. (Manc.), Louisiana State University, Baton Rouge, La., U.S.A.
- 1918 Dodgson, John Wallis, B.Sc. (Lond.), University College, Reading.
- 1913 Doidge, Russell Mervyn, D.C.M., B.Sc. (Lond.), 28a, Louisville Road, Balham, London, S.W. 17.
- 1921 Dolley, Leslie George Francis, B.Sc. (Lond.), 37, St. Albans Road, Watford, Herts.
- 1917 Donaldson, James William, B.Sc. (Edin.), Messrs. Scott's Shipbuilding and Engineering, Co., Ltd., Greenock.
- 1918 Done, Edward, M.Sc. (Birm.), 390, Slade Road, Erdington, Birmingham.
- 1921 Doolan, James Joseph, 46, Michael Street, Waterford, Ireland.
- 1917 Doran, William, B.Sc. (Liv.), 32, Rufford Road, Fairfield, Liverpool.

- 1918 Doughty, Walter David, Fairview, Hansol Road, Bexley Heath, Kent.
- 1918 Dougill, George, M.Sc. (Leeds), Royd House, Heckmondwike, Yorks.
- 1918 Dovey, Ernest Roadley, A.R.C.S., Government Laboratory, Hong Kong.
- 1919 Dowdall, John Patrick Mitchell, B.Sc., A.R.C.S. (Lond.), D.I.C., 23, Portland Street, Huddersfield.
- 1920 Downs, Edgar Stanley, c/o Messrs. Meggitts (1917), Ltd., Sutton-in-Ashfield, Notts.
- 1918 Downing, James, junr., B.Sc.Tech. (Manc.), 21, Thornwood Road, Manor Park, Lee, S.E. 13.
- 1921 Downing, Leonard Alfred, A.C.G.I., 17, Carholme, Road, Forest Hill, London, S.E. 23.
- 1918 Downs, Edmund, M.Sc. (Manc.), 32, Ulundi Road, Blackheath, London, S.E.
- 1917 Doyle, Arthur Lawton, B.Sc. (Manc.), 64, Ellesmere Road, Lower Walton, near Warrington.
- 1919 Drew, Harry Dugald Keith, M.Sc. (Lond.), 83, Greenfield Road, Harborne, Birmingham.
- 1919 Drew, Royston Barry, M.Sc. (Melbourne), c/o Research Department, Royal Arsenal, Woolwich, London, S.E. 18.
- 1919 Druce, John Gerald Frederick, M.Sc. (Lond.), 26, Heslop Road, Balham, London, S.W. 12.
- 1917 Drummond, Alan Ashby, M.Sc. (Manc.), The Lodge, White Cottage, Iver, Bucks.
- 1919 Drummond, John Malcolm, M.Sc. (Vict.), 61, Peak Hill, Sydenham, London, S.E. 26.
- 1920 Drummond, Miss Ruth, B.Sc. (Lond.), Bedford College, Regent's Park, London, N.W. 1.
- 1921 Duerden, Richard Byron, B.Sc. (Lond.), Teniscliffe, Preston Old Road, Blackburn.
- 1920 Dugdale, Miss Clarice Margaret, Upp Hall, Priest Hutton, Carnforth.
- 1920 Dunk, Alfred James, 12, Southwold Road, Clapton, London, E. 5
- 1917 Dunn, Frederick Percy, B.Sc. (Manc.), 20, Hillbury Road, Tooting Common, London, S.W. 17.
- 1919 Dunnicliff, Horace Barratt, M.A. (Cantab.), B.Sc. (Lond.), Government College, Lahore, Punjab, India.
- 1918  Dunningham, Alfred Charles, D.Sc. (Lond.), Electro-Bleach & By-Products, Ltd., Middlewich, Cheshire.
- 1917 Dunsinore, Adam, Dunragit Margarine Works, Dunragit, Wigtownshire.
- 1920 Dunworth, James Francis, B.Sc.Tech. (Manc.), 150, Warwick Road, Carlisle.
- 1920 Dunworth, Sidney William, B.Sc.Tech. (Vict.), c/o Scottish Dyes Ltd., Grangemouth, Scotland.
- 1914 Dutt, Pavitra Kumar, M.A., B.Sc. (Calcutta), M.Sc. (Leeds), Assistant Lecturer in Organic Chemistry, The University, Leeds.
- 1919 Dutton, Frank, B.Sc. (Vict.), 66, Underhill Road, E. Dulwich, London, S.E. 22.

- 1918 Dyer, Alfred, B.Sc.Tech. (Manc.), 33, Evans Square, Newington, Hull.
 1919 Dyer, Joseph William Ward, M.Sc. (Lond.), 22, Grange Road, Gravesend.
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- 1919 East, Frederick John, Barrister-at-Law, Biddenden, Guest Road, Parkstone, Dorset.
 1918 Eastburn, Wilfred James Stevenson, Towerville, Helensburgh, Dumbartonshire.
 1918 Eastick, Arthur Gerald, York House, Butts Farm, Hanworth, Middlesex.
 1918 Eastick, Frederick Charles, M.A. (Cantab.), Malford Lodge, Snaresbrook, London, E. 18.
 1918 Eastick, John Clare Newlands, 2, St. Dunstan's Hill, London, E.C. 2.
 1918 Ebrill, George, B.A. (R.U.I.), 22, Leeson Park Road, Dublin.
 1920 Edwardes, John, M.C., B.Sc. (Wales), Tanffynon, Llangeitho, Cardiganshire.
 1917 Edwards, John, B.Sc. (Birm.), Aquila Refinery, Apartado 161, Tampico, Mexico.
 1919 Eggington, Alfred Thomas, B.Sc., A.R.C.S. (Lond.), The Hawthorns, Ibstock, near Leicester.
 1917 Elborne, Sydney Lipscomb, M.B.E., M.A. (Cantab.), No. 6, Crown Office Row, Inner Temple, London, E.C. 4.
 1919 Ellingham, Harold Johann Thomas, B.Sc., A.R.C.S. (Lond.), 34, Lausanne Road, Hornsey, London, N. 8.
 1917 Ellington, Oscar Charles, B.A. (Oxon), 183, Hither Green Lane, Lewisham, London, S.E. 13.
 1920 Elliott, Frank Larriston, 40, Arundel Gardens, London, W. 11.
 1921 Elliott, George Robert, B.Sc. (Lond.), 27, Lady Bay Road, West Bridgford, Nottingham.
 1917 Elliott, Joseph Campbell, M.C., B.Sc. (Lond.), A.R.C.Sc.I., c/o Messrs. W. Mortimer & Co., Ltd., Orford Tannery, Warrington.
 1919 Ellis, Bernard Albert, B.A. (Cantab.), 4, Mount Adon Park, Dulwich, London, S.E. 22.
 1920 Ellis, George Holland, A.M.C.T., 19, Milwain Road, Levenshulme, Manchester.
 1918 Ellis, George William, O.B.E., B.Sc. (Lond.), 8, Gloucester Road, London, S.W. 7.
 1920 Ellis, Oliver Coligny de Champfleury, M.Sc. (Vict.), Chemical Department, The University, Manchester.
 1919 Elphick, Frederick Charles, 50, College Court, Hammersmith, London, W. 6.
 1918 Elsey, Edwin, B.Sc. (Birm.), 4, Herbert Road, Southall, Middlesex.
 1919 Elworthy, Reginald Thomas, B.Sc. (Lond.), c/o Mines Branch, Department of Mines, Ottawa, Canada.
 1919 Embleton, Arthur, M.Sc. Tech. (Manc.), 13, Fir Street, Walsden, near Todmorden.

- 1919 Emerson, Frederick William, A.M.C.T., 178, Heaton Moor Road, Heaton Moor, near Stockport.
- 1919 English, Ernest Walter Fulton, M.A. (Cantab.), Inspection Laboratories, R.N. Cordite Factory, Holton Heath, Dorset.
- 1918 English, Solomon, M.Sc. (Sheff.), The University, Sheffield.
- 1920 Ennos, Frederick Raine, B.A. (Cantab.), B.Sc. (Lond.), 34, Carminia Road, Upper Tooting, London, S.W. 17.
- 1918 Esling, Fred, A.C.G.I., Ashleigh, Station Road, Herne Bay.
- 1918 Essery, Reginald Ernest, B.Sc. (Bris.), 47, Croxted Road, Dulwich, London, S.E. 21.
- 1920 Eustice, Miss Lovelyn Elaine, B.Sc. (Lond.), Royal Naval College, Greenwich, London, S.E. 10.
- 1921 Evans, Benjamin Beardmore, B.Sc. (Birm.), 48, Oakwood Road, Sparkhill, Birmingham.
- 1918 Evans, David Thomas, B.Sc. (Wales), County School, 3, West Street, Whitland, S. Wales.
- 1920 Evans, Miss Dorothy, B.Sc. (Lond.), 7, Beach Road, Dovercourt, Essex.
- 1919 Evans, Edgar, B.Sc. (Lond.), Westbourne House, Merthyr Vale, Glam.
- 1917 Evans, Evan Thomas, B.Sc. (Wales), 21, York Road, Kettering, Northants.
- 1918 Evans, Frederick Page, B.Sc. (Lond.), 31, Cleveland Road, Crumpsall, Manchester.
- 1919 Evans, Gerald Clifton, Merlin, Banbury Road, Stratford-on-Avon.
- 1917 Evans, Harold Edward, B.Sc. (Birm.), 14, Hindes Road, Harrow-on-the-Hill, Middlesex.
- 1918 Evans, Henry Jackson, B.Sc. (Lond.), Taormina, Burdon Lane, Cheam, Surrey.
- 1918 Evans, Horace George, B.A. (Oxon), M.Sc. (Birm.), 6, Norwood Road, Shipley, Bradford.
- 1920 Evans, Kenrick, A.R.C.S., 84, West Side, Clapham Common, London, S.W. 4.
- 1917 Evans, Lincoln Wycherley, M.C., B.Sc. (Wales), Agricultural College, Wye, Kent.
- 1918 Evans, Percy Edwin, M.A. (Cantab.), 12, Friars Road, Coventry.
- 1920 Evans, William, B.Sc.Tech. (Manc.), 35, Mitchell Street, Ancoats, Manchester.
- 1920 Evans, William Abraham, M.C., B.Sc. (Wales), 11, Heathfield Place, Cardiff.
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- 1921 Ewart, Herbert James, B.Sc. (Birm.), 16, Clarendon Road, Leeds.

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- 1921 Facer, Albert William, B.A. (Oxon), Agricultural Laboratory, Box 387, Salisbury, S. Rhodesia.
- 1918 Fairbrother, Thomas Harold, M.Sc. (Manc.), 15, Park Road, Eccles Old Road, Manchester.

- 1904 Fairhall, Edwin Jesse, A.C.G.I., Lindfield, Windmill Lane, Southall, Middlesex.
- 1921 Falkner, Ernest Basil, M.A. (Oxon), M.Sc. (Manc.), 52, Kensington Mansions, Earl's Court, London, S.W.
- 1918 ² Fallows, Leonard, B.A. (Cantab.), 69, Halesworth Road, Lewisham, London, S.E. 13.
- 1918 Farmbrough, Alfred, 259, Lewisham High Road, London, S.E. 4.
- 1921 ³ Farmer, Cecil Redvers Cheyney, B.Sc., A.R.C.S. (Lond.), 16, Therapia Road, Honor Oak, London, S.E. 22.
- 1918 Farmer, Ernest Harold, B.Sc. (Lond.), The Heath, Shackerstone, Nuneaton.
- 1920 Farmery, Joshua William, B.A. (Cantab.), Wellcome Research Laboratories, Khartoum.
- 1921 Farnell, Miss Gladys, B.Sc. (Lond.), 4, Blenheim Mount, Bradford.
- 1921 Farnell, Robin George Westbury, A.R.C.S., Rector's Lodge, Exeter College, Oxford.
- 1921 Farrar, Edward Kinder, A.M.C.T., 3, Stevenson Drive, Langside, Glasgow.
- 1917 Farrar, Stanley Campbell, B.Sc. (Lond.), D.I.C., 2, Dryden Place, Newington, Edinburgh.
- 1920 Fazackerley, Douglas James, B.Sc. (Liv.), 10, Tiber Street, Princes Park, Liverpool.
- 1921 Fenby, Alaric Vincent Colpoys, B.Sc. (Lond.), 45, Culmstock Road, Clapham Common, London, S.W. 11.
- 1918 Ferguson, James, Mountside, Prestwich Park South, Manchester.
- 1919 Ferguson, John Martin, Craigengar, Dalry Road, Beith, Scotland.
- 1918 Ferlie, Robert, B.Sc. (Edin.), The Leather Cloth Co., Ltd., West Ham, London, E. 15.
- 1918 Fermor, Herbert Frederick Francis Burdett, 32, Trossachs Road, East Dulwich, London, S.E. 22.
- 1918 Ferraboschi, Frederic, M.A. (Cantab.), 21, Lawrie Park Road, Sydenham, London, S.E. 26.
- 1918 Fielden, Harold, B.Sc. (Leeds), P. O. Box 7386, Johannesburg, S. Africa.
- 1903 Fielding, John Frederick Percival.
- 1919 Figg, Eric Francis, 20, Dallin Road, Shooters Hill, London, S.E. 18.
- 1919 Findlater, James, A.R.T.C., 15, Charlesville, Oxtou, Birkenhead.
- 1918 Findley, Albert Edward, B.Sc. (Birm.), 8, Gresford Avenue, Sefton Park, Liverpool.
- 1918 Fine, Isedor, B.A. (Cape of Good Hope), c/o Master of Works Office, The University, Glasgow.
- 1918 Firth, James Brierley, D.Sc. (Manc.), M.Sc. (Dun.), Chemical Department, University College, Nottingham.
- 1918 Fisher, Alfred, B.Sc. (Lond.), 150, Forest Hill, East Kirkby, Notts.
- 1919 Fisher, Ernest Arthur, M.A., B.Sc. (Oxon), Textile Industries Department, The University, Leeds.
- 1918 Fleet, William Frederick, B.Sc. (Lond.), 57, Great Percy Street, London, W.C. 1.

- 1919 Fleming, Robert, A.R.C.Sc.I., The Turf Club, Cairo, Egypt.
- 1919 Fletcher, Dugald Niel, A.R.T.C., Little Aiden, Kilcreggan, Dumbarton-shire.
- 1918 Fletcher, James, M.Sc. (Vict.), Messrs. Titanine, Ltd., Booth Road, Colin Deep Lane, Hendon, London, N.W. 9.
- 1920 Fletcher, Louis, 50, Viewforth Terrace, Edinburgh.
- 1921 Forbes, Malcolm Davidson, B.Sc., A.R.C.S. (Lond.), 2, Leabourne Road, London, N. 16.
- 1918 Forbester, Robert Edward, M.Sc. (Dun.), c/o Messrs. J. W. Roberts, Ltd., Armley, Leeds.
- 1918 Forster, Aquila, M.B.E., M.Sc. (Dun.), Ph.D. (Freiburg), 20, Circus, Greenwich, London, S.E. 10.
- 1917 Forsyth, William Collins, M.A. (Edin.), B.Sc. (Glas.), Hillview, Duddington, Edinburgh.
- 1921 Foster, Cecil Alfred Maunder, M.Sc. (Liv.), 23, Alfred Road, Birkenhead.
- 1919 Foulds, Robinson Percy, M.Sc. (Vict.), Stanley Villa, Colne, Lanes.
- 1920 Fowler, Alexander, M.A., B.Sc. (Glas.), c/o I. Watson, Esq., 24, Henry Street, Langholm, Dumfriesshire.
- 1920 Fowler, Russell Aubrey, B.Sc. (Adelaide), 61, Rookwood Street, Mount Lawley, Western Australia.
- 1919 Fowles, George, B.Sc. (Lond.), 79, Speldhurst Road, Bedford Park, London, W. 4.
- 1917 Fowweather, Frank Scott, M.Sc. (Liv.), 62, Dale Street, Liverpool.
- 1921 Fox, Louis Jean Fielding, B.Sc. (Wales), 198, Lowergate, Longwood, Huddersfield.
- 1920 Fox, Maurice Henry, B.Sc. (Wales), Olinda, The Mount, New Malden, Surrey.
- 1920 Fox, Norman Taylor, 72, The Rand, Easttriggs, Dumfriesshire.
- 1918 Francis, Arthur Clarence, 316, Morningside Road, Edinburgh.
- 1902 Franck, Charles Edward, Shropshire Maltings, Shrewsbury.
- 1921 Fraser, James Ross, A.C.G.F.C., 13, Archibald Road, Tufnell Park, London N. 7.
- 1921 Fraser, Lewis Sidney, A.R.C.S., 44, Benjamin Road, High Wycombe, Bucks.
- 1918 Freeborn, Albert, 25, Seyssel Street, Cubitt Town, London, E. 14.
- 1921 Freeman, Percy Tom, M.B.E., B.Sc. (Lond.), 16, Suffolk Avenue, Southampton.
- 1921 Frew, Hugh Kilpatrick, 83, Siddals Road, Derby.
- 1917 Frith, James Stretton, Ascog, Thelwall, Warrington, Lanes.
- 1920 Frost, Stanley Charles, 12, Charleville Circus, Sydenham, London, S.E. 26.
- 1919 Froyssell, Herbert Henry, 66, Hartington Road, Liverpool.
- 1918 Fuller, Cyril Duncan, Rua Fernandes Thomas 347-1 $\frac{1}{2}$, Porto, Portugal.
- 1921 Fullman, Benjamin, B.Sc. (Lond.), The University, Bristol.
- 1921 Funnell, William Stanley, M.A. (Toronto), 348, Davenport Road, Toronto, Ontario, Canada.

- 1918 Furlong, John Ralph, Ph.D. (Würzburg), 75, Swinderby Road, Wembley, Middlesex.
- 1918 Fyfe, Alexander Walker, M.A., B.Sc. (St. Andrew's), Dalton Grange, Huddersfield.

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- 1918 Gale, Robert Cecil, A.C.G.I., Chemistry Branch, Ordnance College, Red Barracks, Woolwich, London, S.E. 18.
- 1919 Gale, William John, B.Sc. (Lond.), 50, Stanton Road, Wimbledon, London, S.W. 19.
- 1921 Gander, Bernard Vincent, M.B.E., B.Sc. (Lond.), Sutton Valence School, Kent.
- 1918 Gant, Thomas Harold, A.R.C.S., 26, The Ridge, East Riggs, Dumfriesshire.
- 1920 Garbutt, Miss Phyllis Louisa, Bank House, Ledbury Road, South Croydon, Surrey.
- 1918 Gard, John Stanley Fabian, B.Sc. (Dun.), 25, Station Road, Washington Co. Durham.
- 1918 Gardner, Mrs. Gladys Emma Peake, B.Sc. (Lond.), 3a, White Gables, Wood Vale, Forest Hill, London, S.E. 23.
- 1918 Garner, Frederic Horace, Ph.D., M.Sc. (Birm.), Agwi Petroleum Corporation, Ltd., Fawley, Hants.
- 1920 Garner, Frederick Basil, M.C., A.R.C.S., 26, St. George's Road, Wimbledon, London, S.W. 19.
- 1919 Garner, John Henry, B.Sc. (Lond.), Sewage Disposal Works, Deighton, Huddersfield.
- 1919 Garner, William Edward, M.Sc. (Birm.), University College, Gower Street, London, W.C. 1.
- 1904 Garratt, Ernest, M.Sc. (Vict. and Liv.), 137, Livingston Avenue, New Brunswick, N.J., U.S.A.
- 1918 Garratt, Walter Reginald, M.Sc. (Sheff.), 128, Blair Athol Road, Sheffield.
- 1919 Garrod, Ralph Eddowes, M.A. (Cantab.), 5, College Gardens, Dulwich Village, London, S. E. 21.
- 1918 Gaskell, Sam, B.Sc. (Vict.), Cia Mexicana de Petroleo El Aguila, S.A. Apartado 161, Tampico Refinery, Mexico.
- 1905 Gatecliff, John, jun., B.Sc. (Vict.), 3, St. Andrew's Street, Rugby.
- 1919 Gatehouse, Frank Brooks, Maristowe, Butts Green Road, Hornchurch, Essex.
- 1918 Gaunt, Percy, c/o The Municipal Council, Shanghai, China.
- 1918 Geake, Arthur, B.Sc. (Lond.), M.Sc., Ph.D. (Bris.), 337, Gillott Road, Edgbaston, Birmingham.
- 1917 Geake, Frank Henry, M.Sc. (Bris.), c/o Messrs. A. Cairns & Sons, Ltd., Clark Street, Paisley.
- 1918 Geary, Samuel Thomas Talmage, M.A. (Cantab.), The Salt Union, Ltd., Bromsgrove, Worcestershire.

- 1917 Gee, Frank Houghton, B.A., B.Sc. (Oxon), 2, Lily Street, Crumpsall, Manchester.
- 1918 Gee, John Hargrave, B.Sc. (Birm.), 378, Slade Road, Erdington, Birmingham.
- 1918 Genders, Reginald, M.B.E., B.Met. (Sheff.), 84, Wellington Road, Charlton, London, S.E. 7.
- 1920 Gent, Charles Rochester, B.Sc. (Dun.), 74, Addison Road, Heaton, Newcastle-on-Tyne.
- 1921 Gentle, Joseph Alfred Hector Roberts, B.Sc. (Lond.), 21, Owenite Street, Abbey Wood, London, S.E.
- 1920 George, Ernest, B.A. (Cape of Good Hope), M.Sc. (South Africa), c/o University College, Johannesburg, S. Africa.
- 1918 George, Herbert John, B.A. (Oxon), Jesus College, Oxford.
- 1889 Gibbins, Cecil, 9, Dundonald Road, Redland, Bristol.
- 1908 Gibbon, John, Borax Consolidated Ltd., 16, Eastcheap, London, E.C. 3.
- 1919 Gibbs, Geoffrey Harcourt, B.Sc. (Lond.), 18, Russell Road, Kensington, London, W.
- 1919 Gibbs, George Reginald, M.A., B.Sc. (Mane.), Oakleigh, Bath Road, Stourbridge.
- 1917 Gibbs, William Edward, D.Sc. (Liv.), The Salt Union, Weston Point, near Runcorn, Cheshire.
- 1920 Gibson, James, junr., Blackland Cottage, Paisley.
- 1919 Gibson, Stanton, B.Sc. (Lond.), British Dairy Institute, University College, Reading, Berks.
- 1918 Giffen, William Edward, B.Sc. (Lond.), 8, Victoria Road, Harborne, Birmingham.
- 1918 Gifford, Edgar Crathorne, B.Sc. (Bris.), Dalton Grange, Huddersfield.
- 1919 Gilbert, Lionel Felix, B.Sc. (Lond.), Frogmore, Beaconsfield, Bucks.
- 1919 Gilchrist, Miss Elizabeth, B.Sc. (Edin.), 9, Duncan Street, Edinburgh.
- 1919 Gill, Amos, B.Sc. (Mane.), King's Lea, Holland Road, Crumpsall, Manchester.
- 1907 Gillespie, Robert, B.Sc., A.R.C.S. (Lond.), 222, Albert Road, Langside, Glasgow.
- 1919 Gillison, Wilfred, B.A. (Cantab.), 42, Arsenal Road, Eltham, London, S.E. 9.
- 1920 Gilmore, Miss Emmeline Clara, A.R.C.Sc.I., Glen Lea, Bradford Road Fartown, Huddersfield.
- 1917 Gilmour, George Van Barneveld, B.Sc. (Lond.), A.R.C.Sc.I., The Laboratory, Maypole Margarine Works, Ltd., Southall, Middlesex.
- 1918 Girton, Miss Annie Phoebe, B.Sc. (Lond.), 61½, Quentin Road, Blackheath, London, S.E. 13.
- 1919 Girvan, Arthur Frank, B.Sc. (Lond.), 126, Thornlaw Road, West Norwood, London, S.E. 27.
- 1918 Gladding, Geoffrey, M.Sc. (Mane.), 4, Heaton Road, Heaton Norris, Stockport.
- 1920 Glass, William, A.R.C.Sc.I., Chemical Division, Tar and Ammonia Products Works, Beckton, London, E. 16.

- 1920 Glasspoole, John, B.Sc. (Lond.), 16, Pursers Cross Road, Fulham, London, S.W. 6.
- 1919 Glasstone, Samuel, M.Sc. (Lond.), 65, St. George Street, London, E. 1.
- 1906 Glen, George William, A.R.T.C., 256, Darnley Street, Pollokshields, Glasgow.
- 1918 Glendinning, William Gerald, B.A. (R.U.I.), B.Sc. (Q.U.B.), 9, Church Circle, Farnborough, Hants.
- 1919 Glover, Arthur, M.Sc. (Manc.), 37, Grasmere Road, Clarksfield, Oldham, Lanes.
- 1918 Goddard, Archibald Edwin, M.Sc. (Birm.), The University, Edgbaston, Birmingham.
- 1921 Godward, Leslie Wilfred Norman, B.Sc. (Lond.), 136, Kensington Avenue, East Ham, London, E. 12.
- 1919 Goldie, Ernest Murray, 4, Everton Road, Addiscombe, Croydon.
- 1917 Goldsmith, Leon Daniel, B.Sc., A.R.C.S. (Lond.), c/o The Osrarn-Robertson Lamp Works, Ltd., Brook Green, Hammersmith, London, W. 6.
- 1917 Gollop, Harry, B.Sc. (Wales), 13, Park Terrace, South Shields.
- 1919 Goodlet, John Inglis, 54, Linden Grove, Peckham Rye, London, S.E. 15.
- 1921 Gordon, Isaac, B.Sc. (Leeds), 28, Elderslie Road, Eltham, London, S.E.9.
- 1918 Gordon, Peter Ferguson, Chemistry Department, Royal Technical College, Glasgow.
- 1921 Gosling, Frederick, 42, Shakespeare Crescent, Manor Park, London, E. 12.
- 1917 Gosney, Harold William, M.C., B.Sc. (Lond.), Fern Bank, 44, Addiscombe Road, Croydon, Surrey.
- 1917 Goulston, William Wolf, B.A. (Cantab.), B.Sc. (Lond.), c/o The Anglo-Saxon Petroleum Co., Ltd., Miri, Sarawak, Borneo.
- 1918 Graham, Hugh, M.Sc. (Q.U.B.), 125, Wellesley Avenue, Belfast, Ireland.
- 1918 Graham, Joseph, B.Sc. (Dum.), Glen Hurst, Corbridge, Northumberland.
- 1918 Graham, Joseph Ivon, M.A. (Cantab.), M.Sc. (Lond.), A.R.C.Sc.I., Doncaster Coal Owners' Laboratory, Bentley Colliery, Doncaster.
- 1920 Grainger, Herbert Henry, B.Sc. (Lond.), 67, Ulverston Road, Walthamstow, London, E. 17.
- 1919 Grant, Donald, M.A. (Edin.), c/o Messrs. Macfie & Sons, 34, Moorfields, Liverpool.
- 1920 Grant, Reginald Lindsay, M.C., B.Sc. Tech. (Manc.), Church Villa, Northenden, Cheshire.
- 1920 Grantham, Donald Robert, M.C., B.Sc., A.R.C.S. (Lond.), 139, Wakeman Road, Kensal Rise, London, N.W. 10.
- 1919 Gray, Frederick Henry, B.Sc., A.R.C.S. (Lond.), 4, Radmoor Road, Loughborough, Leicestershire.
- 1917 Gray, George, M.Sc. (Liv.), 13, Addison Court Gardens, W. Kensington, London, W. 14.
- 1919 Gray, Harold Heath, B.Sc. (Manc.), Birdwell, near Barnsley, Yorks.
- 1918 Gray, Walter Stroulzer, B.Sc. Agric. (Lond.), Technical Adviser, Disabled Officers' Colony, Kericho, British East Africa.

- 1919 Gray, William Carlaw, A.R.T.C., c/o James Dick, Esq., 19, Waterloo Street, Glasgow.
- 1921 Green, Albert, M.C., B.Sc. (Wales), Tanyfron, 1, Cambridge Terrace, Aberystwyth.
- 1921 Green, Brian Michael, B.A. (Cantab.), 26, Upper Hamilton Terrace, London, N.W. 8.
- 1918 Green, Fred, B.Sc. (Sheff.), 64, Chequer Road, Doncast r, Yorks.
- 1919 Green, George Melling, M.Sc. (Liv.), Chemical Department, Technical College, Huddersfield.
- 1920 Green, John Russell, M.C., B.Sc. (Lond.), 18, Goring Road, Llanelly, S. Wales.
- 1918 Green, Stanley Joseph, M.A. (Cantab.), 2, Burton Avenue, Withington, Manchester.
- 1920 Greenberg, Solomon, 41, Frithville Gardens, Uxbridge Road, London, W. 12.
- 1920 Greenstreet, Victor Robert, A.C.G.F.C., Department of Agriculture, Kuala Lumpur, F.M.S.
- 1918 Greenwood, Maurice, B.A. (Oxon), 15, Toller Drive, Bradford, Yorkshire.
- 1919 Gregory, Arnold William, B.Sc. (Lond.), 50, Crooms Hill, Greenwich, London, S.E. 10.
- 1917 Griffith, Robert Owen, M.Sc. (Liv.), 71, Park Road, Wallasey, Cheshire.
- 1918 Griffiths, Edward Landseer Parry, B.Sc. (Sydney), Chemist's Branch, Department of Agriculture, George Street W., Sydney, Australia.
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- 1919 Griffiths, George Eric, 5, Bertram Road, Manningham, Bradford, Yorks.
- 1921 Griffiths, Philip Henry, B.Sc. (Wales), Arfryn, Alexandra Road, Gorseimon, Glam.
- 1917 Griffiths, Thomas Owen, B.Sc. (Lond.), Oakdale, Colwyn Bay.
- 1920 Griffiths, William Thomas, B.Sc. (Wales), 178, Cathays Terrace, Cardiff.
- 1918 Griffiths-Jones, Ernest, M.Sc. (Manc.), Public Health Laboratories, Cairo, Egypt.
- 1920 Grindle, William George, M.Sc. (Leeds), 27, Grove Road, Clapham Park, London, S.W. 12.
- 1919 Grisenthwaite, Arthur Turner, B.Sc. (Lond.), A.C.G.F.C., 9, Clareview Road, Streatham, London, S.W. 16.
- 1919 Grounds, Arthur, B.Sc.Tech. (Manc.), c/o The Sun Fuel Co., Ltd., North Dock, Swansea.
- 1919 Groves, Miss Ruby Caroline, M.Sc. (Birm.), Imperial Institute, South Kensington, London, S.W. 7.
- 1918 Guest, Peter Healey, M.A., B.Sc. (Manc.), Government Rosin and Turpentine Factory, Jallo, N.W.R., Punjab, India.
- 1920 Gupta, Biraj Mohan, M.Sc. (Allahabad), 21, Cromwell Road, S. Kensington, London, S.W. 7.
- 1921 Gupta, Iresh Chandra, M.Sc. (Calcutta), 70, Municipal Office Street, Dacca, Bengal, India.
- 1919 Guy, William Robert, Scottish Oils, Ltd., Pumpherston Works, Mid Calder.

H

- 1917 Hackney, Norman, B.Sc. (Lond.), Rafiya Margil, Wodehouse Road, Bombay, India.
- 1919 Haddon, Cuthbert Leslie, M.Sc. (Dun.), Silverhill, Denton Burn, Newcastle-on-Tyne.
- 1918 Hadfield, John, M.Sc. (Sheff.), 9, Christchurch Road, Sheffield.
- 1918 Haigh, Thomas, A.R.C.Sc.I., B.A. (N.U.I.), British Scientific Instrument Research Association, 26, Russell Square, London, W.C. 1.
- 1918 Haigh, William Duthie, B.A., B.Sc. (N.U.I. and R.U.I.), A.R.C.Sc.I., British Scientific Instrument Research Association, 26, Russell Square, London, W.C. 1.
- 1919 Hall, Archibald Alexander, M.Sc. (Vict.), Ph.D. (Jena), Agricultural Department, Armstrong College, Newcastle-on-Tyne.
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- 1917 Hall, Eric Morgan, B.Sc. (Birm.), Montrose, Brayton Road, Selby, Yorks.
- 1919 Hall, Norman, Ravensdale, Walmersley Road, Bury, Lancs.
- 1918 Hamer, Miss Frances Mary, M.Sc. (Lond.), 55, Dartmouth Park Hill, London, N.W. 5.
- 1920 Hamer, John Davies.
- 1919 Hamilton, John Campbell, A.M.S.T., 22, Brunel Street, Burnley, Lancs.
- 1917 Hamilton, Robert Russell, M.A., B.Sc. (Glas.), 10, Arnold Street, Birkby, Huddersfield.
- 1918 Hammond, David William, B.Sc. (Glas.), 256, Mansell Road, Small Heath, Birmingham.
- 1917 Hampson, Robert Ernest Victor, D.Sc. (Liv.), National Filling Factory, White Lund, Morecambe.
- 1919 Hampton, Wilfred Marsh, B.Sc. (Lond.), 27, Marshall Street, West Smethwick, Staffs.
- 1921 Hand, Percy George Terry, 199, Selhurst Road, South Norwood, London, S.E. 25.
- 1918 Hanna, Godfrey FitzGerald, B.A. (Cantab.), Carrick, Esher, Surrey.
- 1920 Harbord, Vernon, A.R.S.M., Englewick, Englefield Green, Surrey.
- 1921 Harding, Charles Thompson, B.A., M.Sc. (R.U.I.), Rivington and Blackrod Grammar School, nr. Harwich, Lancs.
- 1909 Harding, Professor Victor John, D.Sc. (Vict.), The University, Toronto, Canada.
- 1919 Hardman, Benjamin, Weald, College Road, Harrow Weald, Middlesex.
- 1919 Hardwick, Walter Arthur Nelson, A.R.C.S., 26, West Kensington Mansions, W. Kensington, London, W. 14.
- 1918 Hargreaves, Frank, A.R.S.M., Laboratory, Ashford Works, S.E. & C. Rly. Co., Ashford, Kent.
- 1918 Hargreaves, George Watson, M.Sc. (Queensland), 49, Redmyre Road, Strathfield, Sydney, N.S.W., Australia.

- 1917 Harler, Campbell Ronald, B.Sc. (Lond.), Tocklai Experimental Station, Cinnamara P.O., Assam.
- 1920 Harley, Robert Bruce, B.Sc. (St. Andrew's), 33, Nile Grove, Edinburgh.
- 1920 Harnaman, James, A.M.S.T., 50, Canal Bank, Port Dundas, Glasgow.
- 1920 Harold, Frederick Clarkson, 10, Regent's Park, Exeter.
- 1919 Harper, Harry, A.R.C.S., B.Sc. (Lond.), 95, Devonshire Street, Keighley, Yorks.
- 1919 Harper, William, B.Sc. (St. Andrew's), Works Manager, Messrs. Lever Bros. (Japan), Ltd., Sannomiya, P.O. Box 174, Kobe, Japan.
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- 1919 Harris, Charles, L.R.C.P., L.R.C.S. (Edin.), A.R.T.C. (Glas.), 41, Forsyth Street, Greenock, Scotland.
- 1921 Harris, Ellis Thomas, B.A. (Cantab.), Faculty of Agriculture, University College, Reading.
- 1919 Harris, John Edmund Guy, B.Sc. (Lond.), Bitterne House, 41, Victoria Road, Cambridge.
- 1918 Harrison, George Frederick, A.R.C.Sc.I., 78, Hollybrook Road, Clontarf, Dublin.
- 1918 Harrison, John Vernon, B.Sc. (Glas.), 34, Rowallan Gardens, Partick, Glasgow.
- 1919 Harrison, Miss Florence Mary, 41, Lyndon Road, Olton, near Birmingham.
- 1918 Harrison, Miss Sophy M., The Poplars, Buckingham.
- 1918 Harrold, Archibald, Fair Acres, Leys Road, Cambridge.
- 1918 Harry, Frederick Thomas, 92, Rodenhurst Road, Clapham Park, London, S.W. 4.
- 1921 Hartley, Bernard Cecil, 28, Oakroyd Terrace, Manningham, Bradford, Yorks.
- 1917 Hartley, Harold, D.Sc. (Manc.), The Gables, Lymm, Cheshire.
- 1918 Hartley, John Alfred, M.Sc. (Leeds), Cowick Grange, Snaith, Yorks.
- 1921 Hartshorne, Norman Holt, B.Sc. (Birm.), 20, Arthur Road, Erdington, Birmingham.
- 1888 Harvey, Henry Cummins, c/o Messrs. Fothergill and Harvey, Ltd., 3, St. Peter's Square, Manchester.
- 1917 Harwood, Henry Francis, M.Sc. (Manc.), Ph.D. (Heid.), The Royal College of Science, London, S.W. 7.
- 1918 Harwood, Samuel Davenport Fairfax, South-Eastern Agricultural College, Wye, Kent.
- 1919 Haselhurst, Hubert William Reay, B.Sc. (Dun.), The Bluff, Crossways, Harpenden, Herts.
- 1918 Hastilow, Cyril Alexander Frederick, M.Sc. (Birm.), 162, Brighton Road, Moseley, Birmingham.
- 1917 Hatton, Arthur Barker, B.Sc. (Manc.), D.I.C., 50, The Crescent, Leftwich, Northwich, Cheshire.
- 1918 Hawley, John William, B.Sc. (Lond.), 49, Craigmillar Road, Langside, Glasgow.

- 1918 Hay, Neil Thomson, c/o North British Rubber Co., Edinburgh.
- 1919 Hay, Robert, Metallurgical Department, Royal Technical College, Glasgow.
- 1918 Haynes, Miss Dorothy, B.Sc. (Lond.), 22, St. Mary Abbott's Terrace, Kensington, London, W. 14.
- 1920 Haycock, John, Hill Top House, Great Glen, near Leicester.
- 1921 Haywood, Arthur, B.Sc. (Lond.), Cowley Boys' School, St. Helen's, Lancs.
- 1917 Hazel, Hubert Henry, M.A. (Cantab.), Caradoc, Balmoral Road, Parkstone, Dorset.
- 1921 Hazeldon, John Nicholson, B.Sc. (Leeds), 74, Woodsley Road, Leeds.
- 1919 Heald, John Arthur, M.C., B.Sc. (Lond.), c/o Messrs. Claus & Co., Clayton, Manchester.
- 1919 Heap, Ernest Thomas Ashley, B.Sc. (Glas.), 9, Newark Drive, Pollokshields, Glasgow.
- 1918 Heasman, Benjamin Richard, B.Sc. (Lond.), Rutherglen, Throwley Road, Sutton, Surrey.
- 1920 Heathcote, Brian, B.Sc. (Liv.), Dulcie Lodge, Riversdale Road, Aigburth Liverpool.
- 1918 Hedley, Edgar Percy, Ph.D. (Leipzig), A.R.C.Sc.I., Howick Road, Town Hill, Maritzburg, Natal, S. Africa.
- 1917 Hegan, Horace James, B.Sc. (Lond.), Spring House, Radford Road, Coventry.
- 1920 Hellings, William, B.Sc. (Wales), Scottish Dyes, Ltd., Murrell Hill Works, Carlisle.
- 1920 Henderson, Henry Willie Caird, A.R.C.S., 34, Barrowgate Road, Chiswick, London, W. 4.
- 1919 Hendry, James, c/o Messrs. Bickford & Sons, Manufacturing Chemists, Currie Street, Adelaide, S. Australia.
- 1918 Henesey, Fred, B.Sc. (Liv.), British Dyestuffs Corporation, Ltd., Ellesmere Port, Cheshire.
- 1919 Henry, John, A.R.T.C.
- 1908 Hepburn, Andrew, c/o Ross Smyth, Clyde Place, Perth.
- 1918 Herbert, Alfred Edwin, B.Sc. (Wales), 73a, Clarendon Road, Higher Crumpsall, Manchester.
- 1919 Herbert, George Girvan, 16, Bank Street, Glasgow, W.
- 1921 Herring, James Norman, 5, Kensington Gardens Square, Bayswater, London, W. 2.
- 1918 Hewitt, James Arthur, Ph.D., B.Sc. (St. Andrews), 68, Underhill Road, Dulwich, London, S.E. 22.
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- 1919 Hickman, Kenneth Claude Devereux, M.B.E., A.R.C.S. (Lond.).

- 1918 Hicks, Cedric Stanton, M.Sc. (Otago), Ravensborne, Dunedin, Otago, New Zealand.
- 1918 Hickson, Bernard, M.Sc. (Leeds), Cedar Lawn, Ackworth, near Pontefract.
- 1919 Higgins, Sydney Herbert, M.Sc. (Manc.), Bleachers Association, Ltd., 4, Norfolk Street, Manchester.
- 1920 Highfield, Alfred, B.A. (Cantab.), Edina, Sidcup, Kent.
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- 1919 Hill, John Isaacs, B.Sc. (Lond.), 75, Claremont Road, Forest Gate, London, E. 7.
- 1919 Hill, John Stableford, 82, The Rand, Eastriggs, Dumfriesshire.
- 1918 Hillman, Eric Stanley, B.Sc. (Lond.), c/o Anglo-Egyptian Oilfields, The Refinery, Suez, Egypt.
- 1917 Himus, Godfrey Wilfred, B.Sc., A.R.C.S. (Lond.), Post Office, Shanghai.
- 1919 Hind, Stanley Reginald, B.Sc., A.R.C.S. (Lond.), c/o Messrs. George Howson & Sons, Ltd., Sanitary Potters, Hanley, Staffs.
- 1920 Hird, Harold Pearson, Moor End, Dewsbury Moor, Dewsbury, Yorks.
- 1920 Hird, Samuel Arnold, c/o H. P. Hird, Esq., Moor End, Lighthouse, Dewsbury.
- 1917 Hiscock, Walter George, B.Sc. (Lond.), Craigview, Ardrossan Road, Saltcoats, Ayrshire.
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- 1918 Hobson, Arthur Bertram, M.Sc. (Vict.), Chemical Research Department, P.O. Box 141, Nairobi, Kenya Colony, British East Africa.
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- 1918 Hodgkin, Adrian Eliot, M.C., 61, Chancery Lane, London, W.C. 2.
- 1919 Hodgkinson, Samuel Edwards, 5, Taylor Street, Heaton Park, Manchester.
- 1918 Hodkin, Frederick William, B.Sc. (Sheff.), 162, Uppertorpe, Sheffield.
- 1919 Holderoft, Arthur Douglas, Wavertree, Bradwell Lane, Porthill, Stoke-on-Trent.
- 1921 Holden, Edmund Haworth, M.Sc. (Vict.), Springhill, Cloughfold, via Manchester.
- 1918 Holden, Frank, B.A. (Cantab.), 3, First Avenue, Heaton, Newcastle-on-Tyne.

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- 1919 Hole, Ernest George, B.Sc. (Birm.), 16, St. Margaret's Road, St. Leonards-on-Sea, Sussex.
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- 1920 Hollingsworth, Clifford, 74, St. Andrew's Road, Cranbrook, Ilford, Essex.
- 1919 Hollins, Cecil, B.Sc. (Lond.), 63, Smedley Road, Cheetham, Manchester.
- 1919 Holmes, Edgar William, 440, Blackmoorfoot Road, Crosland Moor, Huddersfield.
- 1920 Hohnes, Frederick Charles Victor, B.Sc.Tech. (Manc.), 14, Rocklands Avenue, Bebington, Birkenhead.
- 1921 Holmes, Frederick Henry, B.Sc. (Lond.), 21, Albert Street, Melton Mowbray, Leics.
- 1919 Holmes, Henry, A.R.C.S., 29, Malden Hill Gardens, New Malden, Surrey.
- 1917 Holroyd, Thomas Arthur, M.Sc. (Leeds), Hangingstone, Ilkley, Yorkshire.
- 1917 Holt, Fred, O.B.E., M.Sc. (Manc.), 146, Greenway Road, Runcorn, Cheshire.
- 1920 Holt, Percy Ashworth, B.Sc.Tech. (Manc.), Victoria Villas, Egerton, near Bolton, Lanes.
- 1920 Hooley, Leonard Joseph, B.A. (Cantab.), Corpus Christi College, Cambridge.
- 1918 Hopkins, David Graham, B.Sc., A.R.C.S. (Lond.), 43, Rhondda Street, Swansea.
- 1919 Hopkins, Francis Albert Reginald, B.Sc. (Birm.), 52, Highbridge Road, Wylde Green, Birmingham.
- 1919 Hopkinson, George Green, 317, Killinghall Road, Bradford, Yorks.
- 1918 Hora, Frederick Rudolph Hay, B.Sc. (Lond.), Saxonholme, 87, Pepys Road, New Cross, London, S.E. 14.
- 1919 Hornby, Arthur John Ward, B.Sc. (Birm.), Department of Agriculture, Zomba, Nyasaland.
- 1919 Horner, Thomas, M.Sc.Tech. (Manc.), 9, Elm Bank, Humphrey Street, Crumpsall, Manchester.
- 1906 Horsman, Frederick Henry Godfrey, B.Sc. (Lond.), 18, Burney Street, Greenwich, London, S.E. 10.
- 1917 Hothersall, William Christian, M.B.E., M.Sc.Tech. (Manc.), Research Department, Royal Arsenal, Woolwich, London, S.E. 18.
- 1917 Housley, Harold, M.Sc. (Manc.), Assam Place, Cartwright Street, Hooley Hill, near Manchester.
- 1920 Houssa, Armand Henry Joseph, B.Sc. (Lond.), 11, Tremadoc Road, Clapham, London, S.W. 4.
- 1920 Howarth, Gilbert Bartle, M.C., B.Sc. (Leeds), 2, Leopold Mount, Chapeltown Road, Leeds.
- 1918 Howell, Owen Rhys, B.Sc. (Wales), Edward Davies Chemical Laboratories, Aberystwyth.

- 1918 Howells, Oliver Richard, M.Sc. (Lond.), County Secondary School, Ruskin Road, Crewe.
- 1920 Howells, William John, M.Sc. (Wales), 71, Park Street, Clydach Vale, Rhondda, S. Wales.
- 1918 Howie, Matthew, c/o Forrest, 19, Falcon Avenue, Edinburgh.
- 1917 Howlett, Leslie Horace, B.Sc., A.R.C.S. (Lond.).
- 1920 Howson, Charles William Harold, B.Sc. (Birn.), 55, Norfolk Road, Erdington, Birmingham.
- 1920 Huddart, Reginald, B.Sc. (Lond.), 30, Blessington Road, Lee, London, S.E. 13.
- 1917 Hudleston, Lawson John, M.C., B.Sc. (Lond.), University College, Aberystwyth.
- 1921 Hudson, Donald Price, B.Sc. (Liv.), 9, Victoria Drive, West Kirby, Cheshire.
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- 1920 Hudson, Ronald William Austen, A.R.C.S., 68, Greenvale Road, Eltham, London, S.E. 9.
- 1918 Hughes, Edwin Burnhope, 7, Sunburgh Road, West Side, Clapham Common, London, S.W. 12.
- 1920 Hughes, Ednyfed Wynne, M.Sc. (Wales), Secondary School, Hadleigh, Suffolk.
- 1918 Hughes, Ellis, B.Sc. (Wales), 72, Franklin Place, Milwaukee, Wis., U.S.A.
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- 1918 Hughes, Robert John, B.Sc. (Wales), The Grammar School, Manchester.
- 1918 Hume, John, B.Sc. (Edin.), 8, Wardie Crescent, Edinburgh.
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- 1920 Humphries, Ronald, 51, Gordon Road, Monton, Manchester.
- 1920 Hunt, Sydney Walter, B.Sc., A.R.C.S. (Lond.), 21, Hillsborough Road, East Dulwich, London, S.E. 22.
- 1920 Hunter, Harold, M.Sc. (Lond.), 213, Strone Road, Manor Park, London, E. 12.
- 1917 Hunter, Sydney Faulkner, 21, Bedford Street, Liverpool.
- 1919 Hunwicke, Roderick Francis, B.Sc. (Lond.), 7, Steep Holme, Uphill, Weston-super-Mare.
- 1919 Hurren, Frederick Harold, 25, Spencer Avenue, Coventry.
- 1920 Husband, Alfred Dudley. Four Mile House, Bucksburn, Aberdeen.
- 1918 Hussey, Arthur Vivian, O.B.E., A.C.G.I., c/o Duroglass Ltd., Blackhorse Lane, Walthamstow, London, E. 17.
- 1919 Hutchinson, James Joseph, Cecilville, Dollymount, Dublin.
- 1918 Hutchinson, Charles Graham, B.Sc. (Lond.), 76, Upper Tollington Park, London, N. 4.

- 1918 Hyde, Alfred William Tovey, Garth Hay, Bellwell Lane, Four Oaks, Warwickshire.
- 1920 Hyde, Major Claudius George, A.R.C.S., Caddington, Luton.
- 1920 Hyder, Mervyn George Garth, B.A. (Oxon), 60, Newbury Street, Wantage, Berks.
- 1919 Hyland, James, Chapeltown, Pudsey, Yorks.
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- 1909 Hyslop, Neil McNinch, 4, Ronaldshaw Park, Ayr, Scotland.

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- 1918 Ingham, Frank Tinley, B.Sc. (Lond.), 162, Percy Road, Shepherds Bush, London, W. 12.
- 1921 Ingham, George, B.A. (Oxon), c/o Kynochs, Ltd., Umbogintwini, Natal, S. Africa.
- 1920 Ingham, Harry, M.Sc. (Vict.), 17, Cobden Road, Chesterfield.
- 1918 Inglis, Gavin, B.Sc. (Lond.), 115, Birchfield Road, Handsworth, Birmingham.
- 1919 Ingold, Christopher Kelk, M.B.E., M.Sc., A.R.C.S. (Lond.), D.I.C., 20, Rosemont Road, Acton, London, W. 3.
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- 1917 Islip, Harold Thomas, Stilton, St. Mark's Road, Maidenhead.
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- 1917 Jackson, Frederick William, B.Sc. (Lond.), A.C.G.I., 1, Hill Grove Crescent, Kidderminster.
- 1918 Jackson, Joseph Stanley, B.Sc. (Dun.), c/o Shell Marketing Co., Ltd., Shell Haven, Essex.
- 1921 Jackson, Stanley Ridings, B.Sc.Tech. (Manc.), Victoria Hotel, Central Promenade, Blackpool.
- 1918 Jakeman, Alfred Thomas, B.A. (Oxon), 8, Warneford Road, Oxford.
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- 1918 James, Talfryn, B.Sc. (Wales), 1, Stamford Road, Chorlton-cum-Hardy, Manchester.

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- 1919 Jarrard, William John, B.Sc., A.R.C.S. (Lond.), Cleeve Prior, near Evesham.
- 1920 Jarrett, Wilfred Thomas, B.Sc., A.R.C.S. (Lond.), The Laboratory, Minatitlan Refinery, Minatitlan, Vera Cruz, Mexico.
- 1918 Jary, William Frederick, B.A. (Cantab.), 40, Clement Street, Birkby, Huddersfield.
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- 1919 Jefferson, Robert Ernest, M.Sc. (Manc.), 70, Linwood Road, Handsworth, Birmingham.
- 1919 Jeffery, John Hugh, c/o New Pegamoid, Ltd., Marshside Works, Lower Edmonton, London, N.
- 1917 Jenkin, Charles Oswald Frewen, B.A. (Cantab.), The Refinery, Anglo-Egyptian Oilfields, Suez, Egypt.
- 1921 Jenkin, John Watson, 21, Red Lion Road, Tolworth, Surbiton, Surrey.
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- 1919 Jenkins, Percy Gwynn, 15, St. Luke's Road, Bayswater, London, W. 11.
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- 1917 Jensen, Harold Rupert, M.Sc. (Liv.), Woodhay, Leavesden Road, Watford, Herts.
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- 1918 Jobling, Edgar, M.C., B.Sc., A.R.C.S. (Lond.), H.M. Patent Office, 25, Southampton Buildings, London, W.C. 2.
- 1918 Johnson, Harry Tyrer, M.Sc. (Liv.), Graesser Villa, Russell Street, Cefn, Ruabon, N. Wales.
- 1917 Johnson, John Carroll, A.C.G.I., 101, Carpenters Road, Stratford, London, E. 15.
- 1918 Johnson, John Richard, Casita, Glencairn Road, Streatham, London, S.W. 16.
- 1919 Johnson, Joseph Robert, The Croft, Langleys Road, Selly Oak, Birmingham.
- 1918 Johnson, Miss Mary, Newnham College, Cambridge.

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- 1919 Jones, Archibald Orton, M.A. (Oxon), 14, Claremont Road, Cape Hill, Smethwick, Staffs.
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- 1912 Jones, Edward Oswald, B.Sc., A.R.C.S. (Lond.), A.R.S.M., D.I.C., Eastern Smelting Co., Ltd., Dato Kramat Works, Penang.
- 1919 Jones, George Bishop, A.M.I.C.E., 2, Reinwood Road, Lindley, Huddersfield.
- 1917 Jones, George Joseph.
- 1920 Jones, Harold Bramfield, B.Sc. (Lond.), Broadway House, Northolme Road, Highbury, London, N. 5.
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- 1918 Jones, Thomas Gilbert Henry, B.Sc. (Sydney), Department of Chemistry, The University of Queensland, Brisbane, Australia.
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- 1919 Kennedy, Miss Elizabeth Gentle, B.Sc. (Glas.), *see* Raikes.
- 1919 Keane, John, M.Sc. (Dub.), 6, Shamrock Villas, Drumcondra, Dublin.
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- 1919 Knapp, Lionel Frederick, B.Sc. (Lond.), Synthetic Ammonia & Nitrates, Ltd., c/o Castner Kellner Alkali Co., Ltd., Runcorn, Cheshire.
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- 1918 Knox, Archibald, c/o Chemical and Metallurgical Corporation, Ltd., 248, High Street, Harlesden, London, N.W. 10.
- 1920 Kon, George Armand Robert, M.A. (Cantab.), D.I.C., 22, Eaton Mansions, Cliveden Place, London, S.W. 1.

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- 1918 Lacell, Maurice Noel, B.Sc. (Lond.), 17, Finchley Way, Finchley, London, N. 3.
- 1918 Lacy, Sidney Augustus de, 1, Dordrecht Road, Acton, London, W. 3.
- 1920 Laiwala, Kumudchandra Ghelabhai, M.A., B.Sc. (Bombay), c/o Mukundlal Ghelabhai Laiwala, Esq., Balaji Road, Surat, India.
- 1918 Lambie, Alfred, M.Sc. (Liv.), 90, Mulgrave Street, Liverpool, S.
- 1919 Lancaster, Miss Jane, B.Sc., A.R.C.S. (Lond.), 42, Prebend Gardens, Stamford Brook, London, W. 4.
- 1920 Lander, Percy Edward, M.A. (Cantab.), D.Sc. (Lond.), Agricultural Institute, Madras, India.
- 1919 Lane, Francis Henry Newey, B.Sc. (Lond.), Queensberry, 2, Dover Street, Coventry.
- 1917 Lane, Kenneth Westmacott, B.A. (Oxon), Government Laboratory, Hong Kong.
- 1918 Langton, Harold McKee, B.A. (Cantab.), B.Sc. (Lond.), Morpet Refinery, Birkenhead.
- 1919 Lapworth, Morvan, B.Sc., A.R.C.S. (Lond.), 44, Wilton Crescent, Wimbledon, London, S.W. 19.
- 1918 Laughton, Edmund Mainwaring, B.A. (Cape of Good Hope), P.O. Box 201, Durban, Natal, S. Africa.
- 1910 Laughton, Francis Eugene, M.C., British Aluminium Co., Foyers, Scotland.
- 1921 Lawrie, Leslie Gordon, Stornoway, Holden Road, Kersal, Manchester.
- 1920 Lawson, George Ramsey William, Stakes, Westerham, Kent.

- 1919 Lawson, Wilfrid, B.Sc. (Liv.), Dalton Grange, Huddersfield.
- 1918 Laxton, Frank Charles, B.Sc. (Lond.), High Street, Ely, Cambridgeshire.
- 1918 Lay, Douglas, A.R.S.M., c/o Le Roi No. 2 Ltd., Rossland, B.C., Canada.
- 1919 Lazell, Harold, B.Sc. (Lond.), 75, Comeragh Road, Barons Court, London, W. 14.
- 1917 Lea, Henry Turner, M.Sc. (Birm.), Borough Laboratory, George Square, Halifax.
- 1919 Leaper, Clement Joseph, Nun's Island, Galway.
- 1918 Le Brocq, Laurence Francis, B.Sc. (Lond.), 2, Cambridge Road, South Farnborough, Hants.
- 1920 Lee, Harry Laneelot, 10, Hawthorn Terrace, New Earswick, York.
- 1919 Lee, Walter Evelyn, B.A. (Cantab.), The Nook, The Glen, Shipley, Yorks.
- 1919 Lee, William Bell, B.Sc. (Lond.), 4, Winchester Road, Oxford.
- 1920 Lees, Arnold, c/o County Laboratory, 36, Dansie Street, Liverpool.
- 1918 Lefebure, Victor, B.Sc. (Lond.), 9, Glenloch Road, Hampstead, London, N.W. 3.
- 1919 Leicester, Thomas Billington, B.Sc. (Manc.), Airedale Lodge, Stone, Staffs.
- 1918 Leigh, Alfred John, B.Sc. A.R.C.S. (Lond.), Duff House, Banff.
- 1918 Leigh, Walter Norman, M.Sc.Tech. (Manc.), 140, Northgate Road, Stockport, Cheshire.
- 1919 Leipper, Alexander Dawson, 14, Richmond Terrace, Gateshead-on-Tyne.
- 1920 Lerrigo, Arthur Frank, B.Sc. (Birm.), 49, Newton Road, Sparkhill, Birmingham.
- 1919 Leslie, John, B.Sc. (Edin.), 26, Rock Lane, E., Rock Ferry, Birkenhead.
- 1918 Leslie, Miss May Sybil, D.Sc. (Leeds), 8, Ridgeway Terrace, Delph Lane, Leeds.
- 1918 Lever, David, A.R.T.C., 264, Renfrew Street, Glasgow, W.
- 1918 Levingston, Hugh George, A.R.C.Sc.I., Sunnyside, 27, Oakley Road, Ranelagh, Dublin.
- 1919 Levy, Frank, Cia Mexicana de Petroleo El Aguila, Apartado 161, A.O., Tampico, Mexico.
- 1919 Levy, Joseph Frederick, c/o A. Chaston Chapman, Esq., F.R.S., 8, Duke Street, Aldgate, London, E.C. 3.
- 1918 Lewcock, William, B.Sc. (Lond.), Tar Works, Beckton, N. Woolwich, London, S.E.
- 1919 Lewis, Bertram Arthur, B.Sc. (Liv.), Clovelly, Avondale Road, Hoylake, Cheshire.
- 1918 Lewis, Edgar, 37, Marston Road, Knowle, Bristol.
- 1918 Lewis, Francis Charles, B.Sc. (Wales), 15, Bleasedale Avenue, Birkby, Huddersfield.
- 1919 Lewis, Miss Iva Gwendoline, B.A. (T.C.D.), 67, Perham Road, West Kensington, London, W. 14.
- 1918 Lewis, John Stanley, B.Sc. (Wales), Pembroke House, Ferryside, S. Wales.

- 1917 Lewis, Robert Iltyd, B.Sc. (Wales), c/o The Burmah Oil Co., Ltd., Rangoon, Burnah.
- 1921 Lewis, Wilfred James, B.Sc. (Vict.), 22, Richmond Avenue, Sedgley Park, Prestwich, Manchester.
- 1920 Lewis-Dale, Percy, B.Sc. (Lond.), 157, Ruskin Road, Crewe.
- 1919 Linch, Robert, 213, Balfour Road, Ilford, Essex.
- 1920 Lindsay, Miss Johan Dunlop, B.Sc. (Aberd.), 77, Beaconsfield Place, Aberdeen.
- 1919 Lineham, Oswald Reginald, B.Sc. (Lond.), Armorel, Mitchell Place, Saltecoats, Ayrshire.
- 1921 Ling, Edgar Robert, B.Sc., A.R.C.S. (Lond.), Loughborough College, Leicestershire.
- 1919 Linton, Thomas Frederick, A.M.S.T., 26, Seymour Road, Cheadle Hulme, near Stockport.
- 1917 Linzell, Leslie, 101, Carpenters Road, London, E. 15.
- 1918 Littlejohn, Malcolm, M.A., B.Sc. (Glas.), Easter Hallhill House, Baillieston, Lanarkshire.
- 1919 Littler, Robert Pearson, A.M.S.T., Ellesmere, 504, Kensington Hill, Brislington, Bristol.
- 1919 Littlewood, Ernest Alfred, A.M.S.T., 12, Brookfield Road, Crumpsall, Manchester.
- 1918 Lizius, John Leonard, B.Sc. (Lond.), 30, Glencoe Avenue, Seven Kings, Essex.
- 1918 Llewellyn, Benjamin, M.Sc. (Manc.), Hencroft Street, Slough, Bucks.
- 1917 Lloyd, John Lewis, B.Sc. (Wales), Aeron View, Felinfach, S.O., Cardiganshire.
- 1919 Lloyd, Joseph, A.M.C.T., 46, Station Road, N. Reddish, Stockport.
- 1917 Lloyd, William Ellis, B.Sc. (Wales).
- 1918 Loaring, Willie Camble, B.Sc., A.R.C.S., D.I.C. (Lond.), 15, Goddard Avenue, Swindon, Wilts.
- 1919 Lochhead, Kenneth George, A.R.T.C., 23, Park Road, Rugby.
- 1917 Lodge, George, A.R.C.Sc.I., 44, Belmont Avenue, Donnybrook, Dublin.
- 1917 Lomax, Ernest Lawson, M.Sc. (Vict.), c/o The National Oil Refineries, Skewen, near Swansea.
- 1919 Long, Bertram Raymond, B.A. (Dub.), 6, Park Villas, Stillorgan Park, Dublin.
- 1919 Long, Henry Lawrence, B.Sc. (Lond.), 19, Seward Road, Hanwell, London, W. 7.
- 1918 Lorains, John Page, M.C., B.Sc. (Dun.), 3, Kelburn Drive, Paisley.
- 1918 Lorenz, Hans Hugo Herbert, M.A. (Cantab.), Fairfield, Brockley Park, Forest Hill, London, S.E. 23.
- 1921 Lorimer, John William, A.R.T.C., 55, Pembroke Road, Erith, Kent.
- 1918 Lowe, Austin, A.M.S.T., c/o Mrs. W. E. Robbins, 54, High Road, Wood Green, London, N. 22.
- 1920 Lowe, George Morris, A.R.C.S., 4, Kyverdale Road, London, N. 16.
- 1919 Lowe, Harold Newton, B.Sc. (Birm.), Barrister-at-Law, Southbourne, Sheffield.

- 1919 Lowndes, Ashley Gordon, M.A. (Cantab.), Marlborough College, Wilts.
 1920 Lumsdaine, Miss Helen Affleck, M.A., B.Sc. (Edin.), 23, Sciennes Road, Edinburgh.
 1918 Lund, William Jackson, M.Sc.Tech. (Mane.), 91, Mitchell Street, Rochdale, Lancs.
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 1918 Lundholm, Nils Olof, 11, South Beach Avenue, Ardrossan, Ayrshire.
 1920 Lupton, Henry Preston, B.Sc. (Leeds), 2, Langham Avenue, Sefton Park, Liverpool.
 1919 Lush, Ernest Joseph, B.A. (Cantab.), 4, Milner Street, London, S.W. 3.
 1918 Lynn, Norman, 56, Richmond Mount, Headingley, Leeds.

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- 1921 Macaulay, Robert Milroy, 290, Paisley Road, West, Glasgow.
 1918 MacCulloch, Andrew Francis, M.A., B.Sc. (Edin.), McKay's Gardens, Cathedral P.O., Madras, S. India.
 1918 Macdonald, John Hendry, M.A., B.Sc. (Aberd.), 5, Gloucester Road, Belvedere, Kent.
 1920 MacDougall, Duncan, H.M. Fuel Research Station, Blackwall Lane, E. Greenwich, London, S.E. 10.
 1919 Macfarlane, William Wylie, Rosebank, Thorntonhall, Lanarkshire.
 1918 MacIntyre, Kenneth, A.R.C.S., 34, Whitehall Road, Harrow-on-the-Hill.
 1919 MacKechnie, Robert Drysdale, 57, Gracechurch Street, London, E.C. 3.
 1919 MacKenzie, David, 135, South Road, Erdington, Birmingham.
 1919 Mackenzie, Peter, 19, Market Place, Rugby.
 1919 MacKenzie, Thomas, M.A., B.Sc. (Edin.), c/o The Cassel Cyanide Co., Shuna Street, Maryhill, Glasgow.
 1917 Mackerill, John, M.Sc. (Mane.), 138, Greenway Road, Runcorn, Cheshire.
 1918 Maclean, Alexander, A.R.T.C., Seikkyi Refinery, c/o Messrs. Steel Bros. & Co., Ltd., Box 132, Rangoon.
 1921 Maenair, Peter Mackenzie, B.Sc. (Glas.), c/o Shields, 487, Dumbarton Road, Partick, Glasgow.
 1916 Madden, Denis, A.R.C.Sc.I., 40, Wellington Road, St. Luke's, Cork, Ireland.
 1919 Madgin, Walter Matthew, M.Sc. (Dun.), 3, Matfen Place, Fenham, Newcastle-on-Tyne.
 1920 Main, Thomas Lightfoot, B.Sc. (Dun.), 69, Hazelwood Avenue, West Jesmond, Newcastle-on-Tyne.
 1919 Major, Frederick, B.Sc. (Lond.), Vectis, 11, Edgar Road, Sanderstead, Surrey.
 1921 Malkin, Thomas, B.Sc. (Lond.), Golden Square, Warrington.
 1919 Malpas, Harold Joseph, 12, Grand Parade (2nd), Teddington, Middles

- 1918 Mandibleberg, Joseph Harold, M.A. (Cantab.), Redelyffe, Victoria Park, Manchester.
- 1915 Manley, Cyril Hubert, M.A. (Oxon), 17, Booth Avenue, Withington, Manchester.
- 1920 Mann, Donald, B.Sc. (Lond.), c/o The British Westfalite Co., Ltd., Denaby, near Rotherham.
- 1920 Mann, Frederick George, B.Sc. (Lond.), 21, Thurlby Road, West Norwood, London, S.E. 27.
- 1921 Mann, Miss Gladys Ruby, B.Sc. (Lond.), Ianthe, 27, Lansdowne Road, S. Woodford, Essex.
- 1921 Mann, John Colman, B.A. (Cantab.), 51, Chesterton Road, Cambridge.
- 1918 Mann, Sydney Andrew, B.Sc. (Lond.), Pathological Laboratory, Maudsley Hospital, Denmark Hill, London, S.E.
- 1919 Mann, William, B.Sc. (Lond.), 84, Inchmery Road, Catford, London, S.E. 6.
- 1920 Marchant, Ernest Norman, Fairhaven, Ansdell Road, Reddish, near Stockport.
- 1917 Marks, Henry Percy, B.Sc. (Lond.), 49, Muswell Hill Road, Muswell Hill, London, N. 10.
- 1918 Marks, Lewis, A.C.G.I., P.O. Box 108, Gernuiston, Transvaal, S. Africa.
- 1921 Marks, Sydney, B.Sc.Tech. (Manc.), 179, Heywood Street, Hightown, Manchester.
- 1918 Marples, Morris Edgar, M.Sc. (Liv.), c/o China Soap & Candle Co., Ltd., Box 257, Shanghai, China.
- 1919 Marrack, Mrs. Annie Kathleen, B.Sc. (Lond.), Parkfield, Grove Park, Lee, S.E. 12.
- 1918 Marrack, Miss Muriel Tregarthen, B.Sc. (Lond.), 16, Clanricarde Gardens, Hyde Park, London, W. 2.
- 1918 Marsden, Arthur, Hazelnere, Belvoir Road, St. Andrew's Park, Bristol.
- 1919 Marsden, Miss Alice Mary, B.Sc. (Vict.), Boscombe, Imperial Road, Matlock.
- 1919 Marsden, Herbert, B.Sc. (Manc.), Institute of Medical Research, Kuala Lumpur, F.M.S.
- 1920 Marsh, Ernest Victor, B.Sc. (Liv.), 10, Woodland Road, Derby.
- 1920 Marsh, Joseph Kenneth, M.Sc. (Q.U.B.), 28, Lansdowne Road, Belfast.
- 1920 Marshall, James Currie, junr., B.Sc. (Glas.), Corsehillbank, Crosstobs, Barrhead, Glasgow.
- 1919 Marston, Harry Bulmer, B.Sc. (Lond.), 5, De Grey Street, Lord Mayor's Walk, York.
- 1921 Martin, Charles William, 66, Mitcham Road, East Ham, London, E. 6.
- 1905 Martin, Edgar Charles, B.Sc. (Lond.), 20, Derby Road, Woodford, London, E. 18.
- 1920 Martin, Frederick John, M.A. (Cantab.), Gordon College, Khartoum, Sudan.
- 1921 Martin, George, B.Sc. (Birm.), 41, Finchley Road, Westcliff-on-Sea, Essex.
- 1919 Martin, James Wright, M.B.E., B.Sc. (Glas.), Wallace Grove, Kilbarchan, Renfrewshire.
- 1919 Martin William Francis, 18, Moat Place, Edinburgh.

- 1920 Martin, William George, A.C.G.F.C., 31, Queen's Avenue, Blackhall, Midlothian.
- 1919 Mason, Miss Helen, B.Sc. (Edin.), Elmbank, Stow, Midlothian.
- 1920 Mason, Captain Horace George, M.B.E., B.Sc. (Viet.), R.E. Experimental Station, Porton, Wilts.
- 1918 Mason, John Ernest, B.Sc. (Lond.), 3, Woodpath, Southsea, Hants.
- 1919 Mather, Wilfred, 302, Audenshaw Road, Audenshaw, near Manchester.
- 1918 Matthews, Frank, B.Sc. (Lond.), 12, Hurlingham Court Mansions, London, S.W. 6.
- 1918 Matthews, George Leslie, M.C., B.Sc. (Lond.), 44, Princes Road, Teddington, Middlesex.
- 1920 Maurice, Norman Brocklehurst, M.Sc.Tech. (Manc.), 107, Bank Street, Macclesfield.
- 1919 Maxwell, Miss Norah Irene, B.Sc. (Belfast), 21, Derramore Park, Belfast.
- 1917 McArthur, Donald Neil, B.Sc. (Glas.), 28, Grafton Street, Glasgow.
- 1921 McCaffery, Brian James, A.R.C.Sc.I., Royal College of Science for Ireland, Dublin.
- 1917 McCall, Robert, M.A., B.Sc. (Edin.), The Studio, Randalstown, Co. Antrim.
- 1918 McCallum, Louis Francis, Government Analytical Laboratory, Cairo, Egypt.
- 1919 McClelland, Ernest Wilson, B.Sc. (Q.U.B.), 79, Kansas Avenue, Antrim Road, Belfast.
- 1921 McClure, Keith Alister Johnstone, B.A. (Cantab.), Experimental Station, Porton, Salisbury.
- 1918 McCulloch, Andrew, A.M.C.T., Fuel Research Laboratories, College of Technology, Manchester.
- 1920 McEntegart, James Mathews, M.Sc. (Liv.), 36b, Longridge Road, Earl's Court Road, London, S.W. 5.
- 1919 McEvel, Miss Nora, B.Sc. (Belfast), 110, Eglantine Avenue, Belfast.
- 1918 McFadden, Alexander, B.Sc. (Glas.), 5, Apley Road, Doncaster.
- 1918 McFarlane, Archibald, M.Sc. (Leeds), 46, Dunraven Road, W. Kirkby, Cheshire.
- 1920 McHatton, Laurence Patrick, c/o Professor T. M. Lowry, University Chemical Laboratories, Cambridge.
- 1917 McHutchison, William, B.Sc. (Glas.), 69, Cadder Street, Pollokshields, Glasgow.
- 1917 McInroy, John Naylor, M.A., B.Sc. (St. Andrews), Glentilt, Barrie Terrace, South Beach, Ardrossan.
- 1918 McIntyre, Robert, A.R.C.S., 4, Princess Road, Branksome, Bournemouth.
- 1919 McKenzie, Tom Macindoe, Glasscocks, South Ockendon, Essex.
- 1918 McKerrow, John Armour, M.A., B.Sc. (Glas.), High School, Hawick.
- 1918 McKie, Miss Phyllis Violet, M.Sc. (Wales), Castle Bank, Bangor, N. Wales.
- 1918 McKillop, George Francis, Osborne Cottage, Broxburn, West Lothian.

- 1918 McKnight, James Robert, M.A., LL.B. (Cantab.), B.Sc. (Lond.), Barrister-at-Law, Holland County Council Education Committee, Sessions House, Spalding.
- 1917 McLachlan, Thomas, D.C.M., A.C.G.I., 96, Sandrock Road, Lewisham, London, S.E. 13.
- 1918 McLaren, Alexander Williamson, Ramsden Dock, Barrow-in-Furness.
- 1920 McLaren, Donald Alan, M.Sc. (Liv.), 106, Aigburth Road, Liverpool.
- 1919 McLaren, Miss Mary Campbell, M.A., B.Sc. (Glas.), 5, Dundonald Road, Kilmarnock.
- 1918 McLean, Wilfrid, B.A., B.Sc. (N.U.I.), A.R.C.Sc.I., Agricultural Chemistry Department, University College, Old Buildings, Bangor.
- 1917 McLeod, Joseph, c/o Central India Mining Co., Ltd., Kamptie, Central Provinces, Bombay, India.
- 1919 McPolin, James, B.Sc. (N.U.I.), M.B., B.Ch., 7, Clifton Street, Belfast, Ireland.
- 1918 McQueen, James, junr., Clyde House, near Uddingston, Lanarkshire.
- 1919 McQuillen, William Thomson, B.A. (Cantab.), M.Sc. (Dun.), 211, Chesterfield Road, Sheffield.
- 1919 Medsforth, Samuel, B.Sc.Tech., M.Sc. (Manc.), 86, Mount Pleasant Road, Lewisham, London, S.E. 13.
- 1919 Mellon, Douglas, A.R.C.Sc.I., Elm Lawn, Serpentine Avenue, Dublin.
- 1918 Mellor, Benjamin Stanley, M.Sc. (Vict.), Ellerslie, Franklin Road, Saltcoats, Ayrshire.
- 1920 Mellor, Joseph Crosland, B.Sc. (Edin.), Junction Hotel, Marsden, near Huddersfield.
- 1921 Mendel, Eric Lazarus, A.C.G.I., 12, Campden Hill Gardens, Kensington, London, W. 8.
- 1919 Mendoza, Mordecai, B.Sc. (Lond.), 35, Central Road, West Didsbury, Manchester.
- 1917 Menzies, Robert Charles, B.Sc. (St. Andrews), Chemistry Department, United College, The University, St. Andrews.
- 1917 Merheim, Germain, A.R.C.S., 54, Lansdowne Road, Crumpsall, Manchester.
- 1921 Mernagh, Laurence Reginald, A.C.G.I., 6, Grosvenor Road, Highbury, London, N. 5.
- 1919 Mersan, Ferdinand de, Fairfield, Chestnut Avenue, Boston Spa, Yorks.
- 1920 Mertens, Henry Francis Orlando, A.R.C.S., 103, Park Street, Regent's Park, London, N.W. 1.
- 1918 Messenger, Walter George, B.Sc. (Birm.), 36, Wyndham Road, West Ealing, London, W. 13.
- 1918 Meston, William, M.A., B.Sc. (Aberd.), Rosemount, Peterculter, Aberdeenshire.
- 1918 Meyrick, Thidal Francis, B.Sc. (Lond.), 19, Nightingale Square, Balham, London, S.W. 12.
- 1917 Middleton, Arthur Beresford, A.R.S.M., A.M.S.T., c/o Minerals Separation Ltd., 62, London Wall, London, E.C.

- 1920 Middleton, Geoffrey, B.Sc. (Lond.), 80, Woodgrange Road, Forest Gate, London, E. 7.
- 1918 Middleton, Herbert, M.Sc. (Manc.), 12, Park Avenue, Bradford, Yorks.
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- 1917 Miles, Frank Douglas, M.Sc., A.R.C.S. (Lond.), c/o Messrs. Burt, Boulton & Haywood, Ltd., Silvertown, London, E. 16.
- 1918 Miles, William Herbert, 15, Ormiston Road, New Brighton, Cheshire.
- 1921 Miller, Miss Christina Cruickshank, B.Sc. (Edin.), 7, Douglas Street, Kirkealdy, Fife.
- 1918 Miller, Eric Julius, Buckingham Gardens, Perambur Barracks, Madras, India.
- 1889 Miller, James Bruce, M.C., 17, Rubislaw Den North, Aberdeen.
- 1919 Milligan, Arthur George, M.Sc. (Q.U.B.), Admiralty Research Laboratory, Teddington, Middlesex.
- 1920 Mills, James Dick Watson, B.Sc. (Edin.), Central Y.M.C.A. Buildings, Tottenham Court Road, London, W.C. 1.
- 1917 Mills, Laurence Harry, B.Sc. (Birm.), Pennant House, Rowley Regis, Birmingham.
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- 1920 Mitchell, Captain Claude Alexander Dunbar, B.A. (Oxon), 24th Devon Regiment, c/o Secretary for Health, Civil Commissioner's Office, Baghdad, Mesopotamia.
- 1919 Mitchell, Miss Isabel, B.Sc., M.B., Ch.B. (Edin.), Public Health Department, 61, Eastcott Hill, Swindon, Wilts.
- 1919 Mitchell, Robert Kay Sabiston, B.Sc. (Edin.), 25, Montrose Terrace, Edinburgh.
- 1917 Monteith, William, B.Sc. (Glas.), Messrs. Nobel's Explosives Co., Ltd., Ardeer, Stevenston, Ayrshire.
- 1921 Mooney, Paul Michael, B.Sc. (Lond.), 1, Khedive Road, Forest Gate, London, E. 7.
- 1917 Moore, Arthur, B.Sc. (Manc.), The Modern School, Luton, Beds.
- 1918 Moore, Burrows, M.Sc.Tech. (Manc.), B.Sc. Eng. (Lond.), A.K.C., Aiglon, Rowan Avenue, Brooklands, Cheshire.
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- 1919 Moore, George Turpin, M.Sc. (Dun.), Milton House, 19, Neale Street, Roker, Sunderland.
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- 1918 Moore, Robert Alfred, M.Sc. (Dun.), 6, Sunbury Avenue, West Jesmond, Newcastle-on-Tyne.
- 1918 Moore, Robert Charles, M.A., M.Sc. (Liv.), M.Ed. (Manc.), 25, Galloway Road, Waterloo, Liverpool.

- 1918 Moore, Thomas William, M.A., B.Sc. (Edin.), Reba Villa, Rowlands Gill, Co. Durham.
- 1920 Moran, Thomas, B.Sc. (Liv.), 23, Janet Street, Liverpool.
- 1918 Morgan, Benjamin Stanley, B.Sc. (Wales), 18, Pennington Street, Rugby.
- 1917 Morgan, Evan Dulais, B.Sc. (Wales), 15, Hooley Street, Heaton Moor, Stockport.
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- 1917 Morgan, John Richard, B.Sc. (Wales), 84, Chichele Road, Cricklewood, London, N.W. 2.
- 1918 Morley, Frank Isaac, Ph.D. (Heid.), B.Sc. (Lond.), 96, St. John's Road, Birkby, Huddersfield.
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- 1918 Morris, Ivor Prys, B.Sc. (Wales), Government Analytical Laboratory, Cairo, Egypt.
- 1918 Morris, Joseph, M.A. (Oxon), 3, Rydal Bank, Martin's Lane, Liscard, Cheshire.
- 1918 Morrison, James Alexander Shepherd, M.Sc. (Leeds), The Limes, Frodsham, Cheshire.
- 1919 Morrison, Norman, B.Sc. (Lond.), $\frac{7}{8}$ c/o Messrs. R. H. Strickland & Co., Gateacre, near Liverpool.
- 1920 Mortlock, Frank, B.Sc. (Birm.), c/o Messrs. Wardle & Sons, Leekbrook, Leek.
- 1919 Morton, Allan, M.Sc. (Liv.)
- 1919 Morton, Mathew, B.Sc. (Glas.), 134, Corkerhill, Cardonald, Glasgow.
- 1918 Moses, Abram, B.Sc. (Leeds), 117, Peabody Road, South Farnborough, Hants.
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- 1910 Munro, William Tom, 29, Elsee Road, Rugby.
- 1919 Murdoch, Alexander, A.R.T.C., Garden Suburb, Westerton, Dum-bartonshire.
- 1919 Murdoch, Barclay Brown, M.A., B.Sc. (Edin.), Wellsway, Vivian Avenue, Hendon, London, N.W. 4.
- 1918 Mussell, Albert George, 111, Mitcham Road, East Ham, London, E. 6.
- 1917 Myers, James Eckersley, O.B.E., D.Sc. (Manc.), The Chemical Department, The University, Manchester.
- 1918 Myhill, Alphonse Renfred, 1, Daniels Road, Little Bromwich, Birmingham.

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- 1919 Naish, William Archibald, A.R.S.M., 24, University Mansions, Putney, London, S.W. 15.
- 1917 Napier, Oswald James Walter, M.A. (Cantab.), Somerford Park, Congleton, Cheshire.
- 1919 Nash, Albert, Elm Bank, Alma Road, Rotherham, Yorks.
- 1919 Nash, William Adrian Thomas, A.R.C.S., 1, St. Barnabas Villas, Guildford Road, London, S.W. 8.
- 1921 Naylor, Donald Sanderson, B.Sc. Tech. (Manc.), c/o The Calico Printers' Association, Ltd., The Central Laboratory, Rhodes, near Manchester.
- 1919 Neech, Herbert Richard, c/o Messrs. Brands Pure Spelter Works, Irvine, Ayrshire.
- 1918 Needs, Francis Edwin, 90, Cranbrook Road, Redland, Bristol.
- 1918 Neilson, John Francis, B.Sc. (Queensland).
- 1919 Neilson, Matthew, A.R.T.C., 21, Lauderdale Avenue, Earls Park, Newlands, Glasgow.
- 1902 Neumann, Edgar David Maurice, M.A. (Oxon). Ph.D. (Göttingen), Chemical Supply Co., Barking Gas Works, Abbey Road, Barking, London, E. 15.
- 1918 Newbery, George, B.Sc., A.R.C.S. (Lond.), D.I.C., Instow, Westbury Road, New Malden, Surrey.
- 1919 Newcomb, Captain Clive, I.M.S., B.A., M.D. (Oxon), M.R.C.S., L.R.C.P., c/o Messrs. Grindlay & Co., Bombay.
- 1920 Newcombe, Miss Vera, 10, Priory Street, York.
- 1919 Newell, Edwin Frank, A.R.S.M., The Quasi-Arc Co., The Works, Copperfield Road, London, E. 3.
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- 1918 Newman, Sidney Herbert, B.Sc. (Lond.), Alderley House, Oak Avenue, Old Trafford, Manchester.
- 1918 Newton, Arthur Ulysses, B.Sc. (Lond.), 26, Fitzjohns Avenue, Hampstead, London, N.W. 3.
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- 1918 Nicholas, Sydney Diggary, Chemistry Department, The University, Edgbaston, Birmingham.
- 1920 Nicholls, Frederick, D.S.M., B.Sc. (Dun.), c/o Newcastle & Gateshead Gas Co., Redheugh Gas Works, Gateshead-on-Tyne.
- 1919 Nicholls, Noel Albert, M.Sc. (Birm.), Pembrey Chemical Department, Pembrey, Carna.
- 1920 Nickelson, Stanley Arthur, B.Sc. (Lond.), Selworthy, Southwood Road, New Eltham, London, S.E. 9.
- 1920 Nicklin, George Norman, M.A. (Cantab.), 9, Willis Road, Cambridge.

- 1921 Nickolls, Lewis Charles, B.Sc., A.R.C.S. (Lond.), Imperial College of Science and Technology, South Kensington, London, S.W. 7.
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- 1920 Nobbs, Sydney Wallace, B.A. (Cantab), 6, Colls Road, Peckham, London, S.E. 15.
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- 1919 Norman, David John, 36, Greenvale Road, Eltham, London, S.E. 9.
- 1919 Norris, Mrs. Dorothy, M.Sc. (Manc.), The Lister Institute, Chelsea Gardens, London, S.W. 1.
- 1921 Norris, Frederick Walter, B.Sc., A.R.C.S. (Lond.), 11, Warner Road, Hornsey, London, N. 8.
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- 1919 Parker, Horace Victor, M.C., B.A. (Cantab.), Brantwood, 19, Highbury, Monkseaton, Northumberland.
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- 1919 Proud, Miss Annie Kathleen, B.Sc. (Lond.), Parkfield, Grove Park, Lee, London, S.E. 12.
- 1921 Proud, Charles, B.Sc. (Lond.). (*See* Marrack).
- 1920 Pugh, Frank Henry, B.A. (Cantab.), c/o Messrs. Curaçaoische Petroleum Co., Curaçao, Dutch West Indies.
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- 1920 Scarlett, Miss Olive Worth, B.Sc. (Edin.), 54, Malta Road, Leyton, London, E. 10.
- 1918 Scharff, Godfrey Edward, B.A. (Cantab.), Brierwood, Caledonia Road, Saltcoats, Ayrshire.
- 1918 Schoeller, Walter Raymond, Ph.D. (Greifswald), 57, York Street, Baker Street, London, W. 1.
- 1919 Scholefield, Miss Charlotte Bean, M.Sc. (Dun.), The Retreat, Morpeth.
- 1919 Schwartz, Hyam, B.Sc.Tech. (Manc.), A.M.S.T., c/o Farmers' Co-operative Society, Box 510, Salisbury, Rhodesia, South Africa.
- 1919 Scott, Edward Henry, B.Sc. (Dun.), 21, Dalveen Avenue, Davyhulme, Urnston, near Manchester.
- 1918 Scott, James Lang, Twynholm, Bramley, Surrey.
- 1917 Scott, Robert, M.A., B.Sc. (Glas.), 4, Temple Road, Stowmarket, Suffolk.
- 1919 Scott, Thomas, M.C., M.Sc. (Liv.), 46, Merton Road, Bootle, Liverpool.
- 1919 Scoulier, Walter Daly, M.Sc. (Leeds), Corporation Sewage Works, Salterhebble, Halifax.
- 1919 Scrase, Frederick John, B.Sc. (Lond.), W.D. Experimental Station, Porton, near Salisbury, Wilts.
- 1917 Scully, Gerald Creagh, M.A. (Cape of Good Hope), Cape Explosives Works, Ltd., Somerset West, C.P., S. Africa.
- 1920 Seaton, William Dunham, R.E. Experimental Station, Porton, Salisbury.
- 1918 Selfridge, John, M.A., B.Sc. (Glas.), 30, Mannering Road, Shawlands, Glasgow.
- 1917 Sellars, Edwin Lloyd, M.C., M.Sc. (Manc.), 40, Centenary Terrace, Hooley Hill, Manchester.
- 1921 Sensicle, Laurence Henry, B.Sc. (Lond.), 79, Castle Street, Bridgend, Glam.
- 1921 Sewell, William Gawan, M.Sc. (Leeds), Colour Chemistry Department, The University, Leeds.
- 1918 Sewill, John Waterlow, B.A. (Cantab.), Cordite Factory, Aruvankadu, Nilgiri Hills, S. India.
- 1919 Shackleton, Fred, Messrs. H. Precious, Ltd., Vaughan Street, Bradford.
- 1918 Shallcross, Arthur, M.Sc.Tech. (Manc.), 19, Langdale Road, Heaton Chapel, Stockport.
- 1918 Shankie, James, B.Sc. (Glas.), 52, Airlie Gardens, Hyndland, Glasgow.
- 1919 Shankie, Richard Sangster, B.Sc. (Glas.), 15, Highburgh Road, Dowanhill, Glasgow.

- 1919 Shannan, William Vivian, B.Sc. (Lond.), 13, Woodlands Avenue, Wanstead, London, E. 11.
- 1918 Sharp, Frederick Lawrence, Dalton Grange, Huddersfield.
- 1920 Sharp, Thomas Marvel, B.Sc.Tech. (Manc.), Harefield, 13, Moorland Road, Stockport.
- 1919 Shatwell, Hugh George, B.Sc. (Vict.), c/o The Chemical Department, The University, Edgbaston, Birmingham.
- 1921 Shaw, Miss Elsie, B.Sc. (Vict.), Thornhill, Dudley Road, Whalley Range, Manchester.
- 1920 Shearcroft, Walter Francis Fairfax, B.Sc. (Lond.), King's School, Peterborough.
- 1921 Sheldon, Francis Joseph, 17, Conyers Road, Streatham, London, S.W. 16.
- 1917 Sheldon, Norman, A.R.C.S., Coronation Villas, Bamford, Derbyshire.
- 1917 Sheldon, Wilfred, M.Sc. (Manc.).
- 1918 Shepherd, Douglas Howard, M.A., B.Sc. (Vict.), 46, Trafalgar Road, Pendleton, Lanes.
- 1920 Shiels, Douglas Oswald, M.Sc. (Melb.), 125, Ladbroke Grove, Notting Hill, London, W. 11.
- 1917 Shipston, Geoffrey Thomas, B.Sc. (Lond.), 38, Avonmore Road, Kensington, London, W. 4.
- 1919 Shoesmith, John Baldwin, B.Sc. (Vict.), 2, Thursby Square, Burnley, Lanes.
- 1921 Shorrocks, James Norman, B.Sc.Tech. (Manc.), 28, Sefton Road, Sale, Cheshire.
- 1919 Short, Wallace Frank, M.Sc. (Vict.), M.Sc. (N.Z.), Department of Chemistry, Auckland University College, Auckland, New Zealand.
- 1919 Shroff, Hasmukhlal Bhagvandas, B.Sc.Tech. (Manc.), A.M.S.T., Kala-Bhavan Technical Institute, Baroda, India.
- 1920 Shulman, Isaac, M.Sc. (Leeds), 75, Reginald Terrace, Chapeltown, Leeds.
- 1919 Siderfin, Norman Edward, M.Sc. (Leeds), A.C.G.I., Holly Dale, Church Road, Forest Hill, London, S.E. 23.
- 1919 Silver, Leonard, B.Sc., A.R.C.S. (Lond.), Cemetery Lodge, Old Road, Gravesend, Kent.
- 1917 Silvester, William Arthur, M.Sc. (Sheff.), 48, Netherton Road, Worksop, Notts.
- 1918 Simmons, William Hall, The British Nylonite Co., Ltd., Hale End, London, E. 4.
- 1921 Simpkin, Neville, M.Sc.Tech. (Manc.), High Bank, Radcliffe New Road, Whitefield, near Manchester.
- 1919 Singleton, Henry Percival, B.Sc. (Queensland).
- 1918 Singleton, Leslie, B.Sc. (Lond.), 128, Carr Street, Nelson, Lanes.
- 1918 Sinkinson, Eric, B.Sc. (Sheff.), D.I.C., 14a, Albert Bridge Road, London, S.W. 11.
- 1919 Simmatt, Mrs. Louie Midgely, B.Sc.Tech. (Manc.), 321, Great Clowes Street, Higher Broughton, Manchester.

- 1919 Sissons, Alfred Thomas Stanley, B.Sc. (Melbourne), Victorian College of Pharmacy, 360, Swanston Street, Melbourne, Victoria, Australia.
- 1913 Skelton, Edward William, B.Sc. (Lond.), The Laboratory, Mond Nickel Co., Ltd., Globe Works, Newtown Row, Birmingham.
- 1918 Skilling, William James, A.R.T.C., H.M. Fuel Research Station, Blackwall Lane, E. Greenwich, London, S.E. 10.
- 1920 Slack, Harry, D.C.M., B.Sc. (Vict.), 26, Mahood Street, Stockport.
- 1919 Slann, Alfred Ernest Llewellyn, 31, Ranelagh Gardens, Stamford Brook, London, W. 6.
- 1921 Slate, James, B.Sc. (Vict.), 287, Park Road, Oldham, Lanes.
- 1920 Slater, Frank, O.B.E., B.Sc. (Vict.), Church Institute School, Bolton.
- 1918 Slater, James Cumming, 13, Bernard Street, Leith, Scotland.
- 1918 Slater, John Wardle, B.Sc. (Manc.), 5 Oak View, Sandbanks Road, Parkstone, Dorset.
- 1917 Slater, Leonard, M.Sc.Tech. (Manc.), Eden Curwens, Howard Place, Carlisle.
- 1918 Slater, Wilfrid Ernest, M.Sc. (Vict.), 10, Marlborough Road, Lee, Lewisham, London, S.E. 13.
- 1918 Slater, William Kershaw, M.Sc. (Manc.), 83, Greengate Street, Oldham, Lanes.
- 1911 Slim, George Edmundson, B.Sc. (Birm.), The Briars, Fordington Road, Winchester.
- 1917 Smeath-Thomas, John, D.Sc. (Liv.), 18, Gresford Avenue, Sefton Park, Liverpool.
- 1909 Smiley, George Alexander, B.Sc. (Lond.), Officer of Customs and Excise, Chepstow.
- 1920 Smith, Alexander Martin, B.Sc. (Edin.), 13, Viewforth Gardens, Edinburgh.
- 1919 Smith, Alton Ewart Clarence, B.A. (Cantab.), Breydon, Oak Mount Avenue, Southampton.
- 1920 Smith, Cyril Coldron, M.Sc. (Lond.), B.Sc. (Bris.), A.R.S.M., Royal School of Mines, South Kensington, London, S.W. 7.
- 1919 Smith, Cyril Montague, Apartado, 8, Bilbao, Vizcaya, Spain.
- 1921 Smith, David Dow, 16, Empress Avenue, Wanstead Park, Essex, E. 12.
- 1919 Smith, Edgar Francis, Hampden Club, Hampden Street, London, N.W.1.
- 1918 Smith, Frank James, B.Sc. (Liv.), 36, Brelade Road, Liverpool.
- 1918 Smith, Frederick William, B.Sc. (Lond.), 39, Ormonde Road, East Sheen, London, S.W. 14.
- 1918 Smith, George, M.Sc. (Vict.), 33, Queen Street, Gt. Harwood, Lanes.
- 1920 Smith, Herbert Lawrence, B.Sc., A.R.C.S. (Lond.), 49, Limerston Street, Chelsea, London, S.W. 10.
- 1919 Smith, Herbert Procter, Inglewood, Shotton, Chester.
- 1921 Smith, James Frederick, 80, Cannon Hill Road, Birmingham.
- 1920 Smith, John, B.Sc. (Glas.), 31, Dempster Street, Greenock, Scotland.
- 1918 Smith, John Campbell, B.Sc. (Edin.), Heriot-Watt College, Edinburgh.

- 1917 Smith, Joseph de Carle, B.Sc. (Lond.), 67, Newmarket Road, Norwich.
- 1920 Smith, Louis Gregory, The Brewery, Falkirk.
- 1921 Smith, Robert Christie, M.A., B.Sc. (Glas.), 25, Allan Park, Stirling.
- 1919 Smith, William, 84, Nelson Street, Carlisle.
- 1918 Smout, Arthur John Griffiths, c/o Messrs. Cooper & Goode, Ltd., Bradford Street Works, Birmingham.
- 1910 Solomon, Joseph Bernard, B.Sc., A.R.C.S. (Lond.), A.R.S.M.
- 1918 Somer, Arthur Joseph, B.Sc. (Lond.), 11, Clarence Road, Mottingham, Eltham, London, S.E. 9.
- 1921 Soper, Frederick George, B.Sc. (Wales), 32, Friars Avenue, Bangor, N. Wales.
- 1918 Sorrell, Mrs. Janet Louisa, A.R.C.Sc.I., 7, The Homesteads, St. James's Lane, Muswell Hill, London, N. 10.
- 1921 Sowter, Percy Frederick Combe, B.Sc., A.R.C.S. (Lond.), 45, Hillfield Avenue, Hornsey, London, N. 8.
- 1920 Sparling, Miss Ellen Emma, S. Ursula's, Brooke Street, Holborn, London, E.C. 1.
- 1919 Speakman, Gruffydd Thomas, B.Sc. (Wales), Penisarwaen, Llanrug, Carnarvon.
- 1920 Spearing, Colin Everett, A.C.G.I., Winslade, Eversfield Road, Reigate, Surrey.
- 1918 Spiers, Charles William, M.Sc. (Bris.), 1, Dundonald Road, Redland, Bristol.
- 1917 Spiers, Henry Michael, M.A. (Cantab.), B.Sc. (Lond.), 34, Brondesbury Road, London, N.W. 6.
- 1918 Spilman, George Herbert, 8, Waterloo Place, London, S.W. 1.
- 1919 Spurling, Abraham Charles, 120, Hoe Street, Walthamstow, London, E. 17.
- 1920 Srivastava, Jwala Prasad, M.Sc.Tech. (Vict.), A.M.S.T., Civil Lines, Cawnpore, India.
- 1920 Stafford, William, M.Sc. (Vict.), Water House, Adlington, near Chorley, Lancs.
- 1919 Stanhope, Percy Edward, 167, Highgate, Heaton, Bradford.
- 1918 Stanier, Harold, B.A. (Cantab.), Ivy Cottage, Saverley Green, Blythe Bridge, Stoke-on-Trent.
- 1918 Stansfield, John Firth, A.R.C.S., Directorate of Chemical Inspection, Royal Arsenal, Woolwich, London, S.E. 18.
- 1920 Stansfield, William James, A.R.C.S., 23, Bell Hall Terrace, Savile Park, Halifax.
- 1919 Stanworth, James, B.Sc. (Manc.), c/o 7, Stradella Road, Herne Hill, London, S.E. 24.
- 1918 Stark, David Carmichael, Glaston Cottage, Victoria Avenue, Borrowash, near Derby.
- 1919 Staveley, John, B.Sc. (Leeds), 11, Roper Street, Whitehaven, Cumberland.
- 1918 Stedman, Ernest, M.Sc. (Vict.), Upholland Grammar School, Orrell, Wigan.
- 1918 Steele, Arthur Robert Victor, 12, Whitby Road, Toller Lane, Bradford.

- 1920 Stephen, Alexander Charles, B.Sc. (Aberd.), 28, Brighton Place, Aberdeen.
- 1917 Stephens, Francis George Coad, The Cottage, Tenter Hill, New Mill, Huddersfield.
- 1918 Stephens, Victor Ewart, A.R.C.Sc.I., 6, Willow Road, Altrincham, Cheshire.
- 1919 Stephenson, James, B.Sc. (Lond.), Oaklands West, Eltham Road, Lee, London, S.E. 12.
- 1918 Stern, Harry, B.Sc. (Lond.), 121, Grey Street, East Melbourne, Victoria, Australia.
- 1919 Sterne, Edward Tyghe, B.Sc. (Ontario), c/o Messrs. E. T. Sterne & Sons, Chemical Manufacturers, Brantford, Canada.
- 1921 Stevens, Stanley, B.Sc. (Lond.), 114, St. Peter's Road, Leicester.
- 1919 Stevenson, James Arnold, 76, Hodges Street, Wigan.
- 1917 Steventon, Joseph William, B.Sc. (Wales), c/o Messrs. McDougall Bros., Ltd., Irk Vale Chemical Works, Chadderton, near Oldham.
- 1918 Stewart, Alan West, D.Sc. (Brussels), 29, Westbere Road, Cricklewood, London, N.W. 2.
- 1916 Stewart, Andrew, B.Sc. (Glas.), 111, Petershill Road, Glasgow.
- 1920 Stewart, Corbet Page, B.Sc. (Dun.), Department of Chemistry, The University, Edinburgh.
- 1919 Stewart, Lanchlan Macquarie, M.A., B.Sc., B.Sc.Agric. (Edin.), 28, Third Avenue, Selly Park, Birmingham.
- 1919 Stewart, Robert Forbes, M.C., 35, Roxburgh Circus, Cardonald, Glasgow.
- 1913 Stich, Alexander Benham, M.B., Ch.B., B.Sc. (Glas.), Riccarton Avenue, Paisley.
- 1918 Stickings, Ralph William Ewart, O.B.E., B.Sc. (Lond.), D.I.C., The Rowans, Ravensbury Park, Morden, Surrey.
- 1918 Still, Charles James, M.Sc. (Belfast), B.Sc. (Lond.), Municipal College of Technology, Belfast.
- 1919 Stirling, Miss Elizabeth Brownsword, B.Sc. (Glas.), 61, Clarendon Road, Lewisham, London, S.E. 13.
- 1920 Stockley, Gordon Murray, A.R.C.S., 10, Ashley Road, Addiscombe, Croydon.
- 1919 Stocks, Frederick Arnold, B.Sc. (Manc.), Sonning, Leicester Road, Hale, Cheshire.
- 1918 Stocks, Herbert Holroyd, M.Sc. (Leeds), c/o British Dyestuffs Corporation, Blackley, Manchester.
- 1919 Stokes, Joseph Arthur, B.Sc. (Lond.), Field Cottage, Bradley, near Huddersfield.
- 1918 Stokes, William Henry, 10, Lydgate Road, Coventry.
- 1918 Stokoe, William Norman, B.Sc. (Lond.), Craigmillar Creamery Co., Ltd., Craigmillar, Midlothian.
- 1917 Stone, Horace Gilbert, B.Sc. (Lond.), 14, Dover Street, Higher Crumpsall, Manchester.
- 1917 Stones, George Bertram, B.Sc. (Vict.), 50, Woolwich Road, Belvedere, Kent.

- 1917 Stopford, Thomas Rinck, M.Sc. (Manc.), Woodbank, Macclesfield.
- 1921 Storer, George Paterson, 48, Llanthewy Road, Newport, Mon.
- 1913 Storey, Mrs. Dorothy Jessie, Home Cottage, Wick, near Bristol.
- 1920 Stott, Clarence, B.Sc. (Leeds), Holywell Brook, Holywell Green, near Halifax, Yorks.
- 1920 Stott, George Herbert, B.Sc. (Liv.), 16, Lynwood Road, Rice Lane, Liverpool.
- 1920 Strachan, James Thallon, c/o The Carbrox Co., Inc., North Scott & St. Louis Streets, New Orleans, La., U.S.A.
- 1921 Strafford, Norman, B.Sc. (Lond.), 21, Smedley Lane, Cheetham Hill, Manchester.
- 1919 Straw, Keith Blundell, Cumberland, Bay Road, Sandringham, Victoria, Australia.
- 1918 Streatfeild, Frederick Henry, 54, Belgrave Road, Wanstead, London, E. 11.
- 1918 Stringfellow, William Arthur, 70, Hunter Road, Southsea, Hants.
- 1921 Stubbings, Wilfred Victor, B.Sc. (Lond.), Dalton Grange, Huddersfield.
- 1918 Stubbs, Charles William Oswald, B.Sc. (Melbourne), Cordite Factory, Maribyrnong, Victoria, Australia.
- 1918 Stutterd, Lancelot Frederick Norman, B.Sc. (Tasmania), Ashleigh, Winyard, Tasmania.
- 1917 Sugden, James Netherwood, B.Sc., A.R.C.S. (Lond.), D.I.C., 7, Old Deer Park Gardens, Richmond, Surrey.
- 1917 Sugden, Reginald, 121, Tong Road, Leeds.
- 1917 Sugden, Samuel, A.R.C.S., Birkbeck College, Breams Buildings, Chancery Lane, London, E.C.
- 1919 Sumner, Andrew Theodore, M.C., B.Sc. (Lond.), 18, Lincoln Road, Sidecup, Kent.
- 1919 Sutcliffe, Hubert Thomas, B.Sc. (Vict.), Lyndon, Baxter Road, Sale, Cheshire.
- 1911 Sutcliffe, John Algernon Lacy, c/o Messrs. J. B. Walker & Co., Ltd., Oxford Street, Hull.
- 1920 Sutcliffe, Ronald, M.A. (Oxon), Geological Survey Office, Museum of Practical Geology, Jernyn Street, London, W. 1.
- 1918 Swann, Herbert, B.Sc.Tech. (Manc.), 62, Old Road, Blackley, Manchester.
- 1917 Symonds, Gwilym, B.Sc. (Wales), Grove Park County School, Wrexham, N. Wales.

T

- 1917 Taberner, Edwin, M.Sc. (Manc.), Cape Explosives Works, Ltd., P.O. Dynamite Factory, Somerset West, Cape Province, S. Africa.
- 1902 Tainsh, Peter Wright, O.B.E., 1, Craiglands, Spital, Cheshire.
- 1920 Tait, Leonard, B.Sc. (Glas.), Applegarth, Albert Drive, Pollokshields, Glasgow.

- 1918 Tatam, George William Gerald, 3, Courtney Road, Waddon, Croydon, Surrey.
- 1918 Tatton, Samuel Bertram, B.Sc. (Lond.), 7, Greenclose Road, Ilfracombe.
- 1919 Tavroges, Joseph, B.Sc. (Lond.), 137, Elizabeth Street, Hightown, Manchester.
- 1920 Taylor, Albert, B.Sc. (Vict.), North View, Buxton Road, Disley, Cheshire.
- 1917 Taylor, Arthur, M.Sc. (Leeds), 179, Beeston Road, Leeds.
- 1919 Taylor, Charles William, A.R.C.S., The Anglo-Egyptian Oilfields, Ltd., The Refinery, Suez.
- 1919 Taylor, Charles Williams, B.Sc. (Lond.), 85, Bradford Road, Brighouse, Yorks.
- 1920 Taylor, Cyril Bertram, A.R.C.S., *c/o* The Magadi Soda Co., Magadi, Kenya Colony (*via* Aden).
- 1919 Taylor, Edward McKenzie, M.B.E., M.Sc. (Dun.), Egyptian Ministry of Agriculture, Cairo, Egypt.
- 1918 Taylor, Francis, B.Sc. (Vict. and Leeds), Westgate House, North Cave, East Yorks.
- 1920 Taylor, Harry Alan, Imports and Exports Office, Hong Kong.
- 1921 Taylor, Henry Frankland, 299, Eccles New Road, Salford, Manchester.
- 1918 Taylor, Hubert, B.Sc. (Birm.), West Mount, Crosbie Road, Harborne, Birmingham.
- 1921 Taylor, Lionel Theos, M.Sc. (Dun.), 1, Bideford Gardens, Whitley Bay, Northumberland.
- 1919 Taylor, Miss Millicent, D.Sc. (Bris.).
- 1921 Taylor, Nathan, M.Sc.Tech. (Manc.), 245, Cheetham Hill Road, Manchester.
- 1919 Telfer, Stephen Veitch, M.B., Ch.B. (Glas.), 533, Victoria Road, Crosshill, Glasgow.
- 1920 Tesh, William, M.A., B.Sc. (Oxon), 43, Leeds Old Road, Thornbury, Bradford, Yorks.
- 1918 Thin, Russell Gibson, B.Sc. (Edin.), 2, Chalmers Crescent, Edinburgh.
- 1918 Third, John, M.A., B.Sc. (Aberd.), 32, Caledonia Road, Saltcoats, Ayrshire.
- 1917 Thomas, Alfred Ernest, B.Sc. (Wales), Public School, Kinlochleven, Argyleshire.
- 1918 Thomas, David, B.Sc. (Wales), Ivy Cottage, Ton Pentre, Rhondda, S. Wales.
- 1919 Thomas, Fred, B.Sc. (Wales), Grove House, Kirk Lane, Yeadon, near Leeds.
- 1920 Thomas, Francis Edwyn, M.A. (Oxon), 9, Hart Grove, Ealing Common, London, W.
- 1918 Thomas, Hugh Arwel, M.Sc. (Wales), 34, High Street, Rhos, Wrexham, N. Wales.
- 1918 Thomas, John Sidney Gordon, D.Sc. (Lond. and Wales), A.R.C.S., Physical Laboratory, South Metropolitan Gas Co., 709, Old Kent Road, London, S.E. 15.

- 1919 Thomas, Lewis Edward, B.Sc. (Wales), Angorfa, Elwy Street, Rhyl, N. Wales.
- 1918 Thomas, Richard, M.Sc. (Wales), 46, Dacre Hill, Rock Ferry, Cheshire.
- 1918 Thomas, William, B.Sc. (Wales), Village View, Clynderwen, S. Wales.
- 1918 Thompson, Guy Maurice, B.Sc. (Lond.), Park Cottage, Ingbirchworth, near Penistone, Yorks.
- 1920 Thompson, Harold, M.A., B.Sc. (Aberd.), 114, Coniston Road, Edinburgh.
- 1919 Thompson, Herbert Bryan, M.Sc. (Birm.), Ph.D. (Würzburg), c/o National Oil Refineries, Ltd., Skewen, Glamorgan.
- 1920 Thompson, Hugh Vernon, M.A. (Cantab.), Croft House, Garden Village, Stoke-on-Trent.
- 1921 Thompson, Leonard, M.Sc. Tech. (Manc.), 36, Palm Street, Slade Lane, Manchester.
- 1919 Thompson, Mark, B.A. (Cantab.), 68, Clarendon Road, Notting Hill, London, W. 11.
- 1920 Thomson, James Simpson, M.A., B.Sc. (Aberd.), Station House, Bieldside, Aberdeen.
- 1920 Thomson, William Lockerbie, B.Sc. (Edin.), 51, Bowes Road, Bowes Park, London, N. 13.
- 1903 Thorburn, James, Kenilworth, Shore Road, Stevenston, Ayrshire.
- 1921 Thorne, Emmanuel Isaac, 13, Cantwell Road, Woolwich, London, S.E. 18.
- 1921 Thorne, Percy Cyril Lesley, M.A. (Cantab.), 40, Kidbrooke Park Road, Blackheath, London, S.E. 3.
- 1920 Thornton, Edwin, B.Sc. (Leeds), 9, Heol-y-Nant, Clydach, S.O., Glam.
- 1919 Tilley, Cecil Edgar, B.Sc. (Adelaide and Sydney), The Sedgwick Museum, Cambridge.
- 1917 Timbrell, John, B.Sc. (Lond.), Clovelly, Altwood Bailey, Maidenhead.
- 1920 Timmis, Laurence Barnett, B.Sc.Tech. (Manc.), 50, Claremont Road, Moss Side, Manchester.
- 1919 Tincknell, George Mark, B.Sc. (Bris.), 66, Ravenswood Road, Bristol.
- 1918 Todd, Ernest Herbert, M.A. (Oxon), The Technical College, Workington, Cumberland.
- 1920 Tomkinson, Miss Margaret Grosvenor, Faculté des Sciences, Université, Toulouse, France.
- 1919 Tompkin, Albert, 104, Lenton Boulevard, Nottingham.
- 1918 Topp, Arthur Albert, Cordite Factory, Maribyrnong, Melbourne, Victoria, Australia.
- 1919 Toppin, Richmond Douglas, Millett Street, Hurstville, N.S.W., Australia.
- 1921 Townend, Donald Thomas Alfred, B.Sc. (Lond.), 133, Mount Pleasant Lane, Upper Clapton, London, E. 5.
- 1918 Towse, Walter, c/o Messrs. Clark, Son & Morland, Ltd., Glastonbury.
- 1920 Toyne, Francis Digby, M.A. (Cantab.), The Heights, Rochdale, Lanes.
- 1920 Tribley, Harold George, Kent House, Lighton Road, Cheltenham Spa.

- 1919 Trickett, Anthony Berry, M.Sc.Tech. (Manc.), 101, Alderson Road, Alum Rock, Saltley, Birmingham.
- 1920 Trindle, John Henry, B.Sc. (Birm.), 142, Newcombe Road, Earlsdon, Coventry.
- 1919 Trippier, Frank, B.Sc. (Manc.), Major Street, Crawshawbooth, Manchester.
- 1918 Trotter, John Robert, A.R.C.S., National Dyes, Ltd., Buttershaw, Bradford.
- 1918 Trotter, William, A.R.C.S., 9, Southfield Square, Bradford.
- 1918 Tryhorn, Frederick Gerald, M.Sc. (Liv.), Chemistry Department, The University, Sheffield.
- 1920 Tunstall-Behrens, Mrs. Gwen, Porth-en-alls, Marazion, R.S.O., Cornwall.
- 1919 Turner, Bertrand, B.Sc. (Birm.), 55, Golden Hillock Road, Small Heath, Birmingham.
- 1917 Turner, Eustace Ebenezer, D.Sc. (Lond.), 39, Victoria Road, Chingford, London, E. 4.
- 1918 Tutton, Henry Ralph, 1, Wentworth Street, Huddersfield.
- 1918 Twine, William Alfred, Aden House, Hillaries Road, Gravelly Hill, Birmingham.
- 1920 Twist, Harold, B.Sc. (Manc.), 184, Tempest Road, Beeston Hill, Leeds.

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- 1917 Upton, Adolph William Henry, A.C.G.I., Brooklyn, Tavistock Road, South Woodford, London, E. 18.
- 1918 Urquhart, Hugh Campbell, B.Sc. (Melbourne), Craigston, Coppin Street, E. Malvern, Melbourne, Australia.
- 1921 Urquhart, John Cramond, B.Sc. (Lond.), East Anglian Institute of Agriculture, Chelmsford, Essex.

V

- 1917 Vakil, Kapilram Hardevram, B.A. (Bombay), M.Sc.Tech. (Manc.), Santa Cruz, Bombay, India.
- 1917 Valentine, Abraham Henriques, M.Sc. (Vict.), Gonville House, Cambridge.
- 1918 Vallance, Reece Henry, B.Sc. (Birm.), 284, Franklin Road, King's Norton, Birmingham.
- 1920 Vaughan, Reginald Edward, Harper Adams Agricultural College, Newport, Salop.
- 1919 Venn, Hubert John Patridge, B.Sc. (Lond.), Twyford, Hargate Drive, Hale, Cheshire.
- 1920 Vernon, William Harold Juggins, B.Sc. (Birm.), 6, High Street, Wimbledon, London, S.W. 19.
- 1918 Vickers, William, B.Sc.Tech. (Manc.), 49, St. Mary's Road, Manningham, Bradford, Yorks.

- 1918 Vincent, John Willford, B.Sc. (Bris.), c/o The Anglo-Saxon Petroleum Co., Miri, Sarawak, N.W. Borneo.
- 1919 Voss, Walter Arthur, Fairlight Glen, Eastwood Road, Rayleigh, Essex.

W

- 1918 Waele, Armand de, c/o Messrs. D. Gestetner, Neo-Cyclostyle Works, Tottenham Hale, London, N. 17.
- 1919 Walden, Alfred Edward, B.Sc. (Lond.), Wilson College, Bombay, India.
- 1919 Walker, Andrew Dykes, B.Sc. (Edin.), 1, W. Brighton Crescent, Portobello, Edinburgh.
- 1919 Walker, Charles, M.Sc. (Vict.), Waterloo House, Leamington Spa, Warwickshire.
- 1918 Walker, Eric, B.Sc. (Wales), Training College, Pembroke Road Hostels, Erith, Kent.
- 1918 Walker, Frederick Handel, B.Sc. (Dun.), 3, Stannington Grove, Newcastle-on-Tyne.
- 1919 Walker, Frederick Thomas, B.Sc. (Lond.), Brendon, Clarence Road, Hersham, Surrey.
- 1918 Walker, Frederick Wilson, A.R.C.S., Devon House, Diamond Street, Saltburn-by-the-Sea.
- 1919 Walker, John Henry, A.R.T.C., Gourepore Works, Naihati, E.B. Ry., Bengal.
- 1918 Walker, Richard Gaston, 209, Ripon Street, Ballarat, Victoria, Australia.
- 1917 Walker, Thomas Kennedy, B.Sc. (Manc.), Meadow Bank, Hollingworth, near Manchester.
- 1920 Wallace, Miss Janet Adam, B.Sc. (Glas.), 52, Low Glencairn Street, Kilmarnock.
- 1918 Wallace, Thomas, M.C., M.Sc. (Dun.), University of Bristol Research Station, Long Ashton, near Bristol.
- 1918 Wallace, Thomas, M.Sc. (Dun.), c/o Messrs. Castner-Keller Alkali Co., Ltd., Wallsend-on-Tyne, Northumberland.
- 1920 Walls, Noel Stanley, B.Sc. (Manc.), 45, Platt Lane, Hindley, near Wigan.
- 1920 Wahmsley, James Rawson, A.M.C.T., Dean Brook Cottage, Dean Lane, Moston, Manchester.
- 1917 Walsh, Michael Joseph, M.Sc. (N.U.I.), 11, Thomas Hill, Waterford.
- 1918 Walsh, Thomas Crosbie, 53, Rosebery Road, Muswell Hill, London, N. 10.
- 1919 Walters, David Henry, B.Sc. (Wales), Oakfield, Brampton Road, Bexley Heath, Kent.
- 1920 Ward, Harry, B.Sc. (Leeds), Mount Terrace House, Holgate, York.
- 1918 Ward, Percy James, M.Sc. (Birm.), c/o ²/₂Attoch⁻Oil Co., Rawal Pindi, India.
- 1917 Wardlaw, William, M.Sc. (Dun.), The University, Edmund Street, Birmingham.

- 1917 Warnoford, Francis Henry Sweeting, B.A. (Cantab.), B.Sc. (McGill), St. John's, Antigua, British West Indies.
- 1918 Waters, Percy Wharton, 3, Stanley Road, Heaton Moor, Stockport.
- 1918 Watkinson, Hugh Leslie, B.A. (Cantab.) 21, Lynndale Avenue, Birkby, Huddersfield.
- 1921 Watson, Arthur Frederick, B.Sc. (Lond.), 39, Guilford Street, London, W.C. 1.
- 1919 Watson, Miss Amy Rose, B.Sc. (Lond.), 27, Union Road, Clapham, London, S.W. 4.
- 1920 Watson, George Marwood, B.Sc., A.R.C.S. (Lond.), 115, Hainton Avenue Grimsby, Lines.
- 1918 Watson, Herbert Ben, B.Sc. (Wales), Bryn Eglwys, Holyhead Road, Bangor.
- 1908 Watson, Herbert Edmeston, D.Sc. (Lond.), Indian Institute of Science, Bangalore, India.
- 1918 Watson, Herbert Louis, B.Sc. (Aberd.), 5, Beech Avenue, Dumbreck, Glasgow.
- 1918 Watson, John, M.C., B.Sc. (Dun.), 4, Kendrew Street, Darlington.
- 1919 Watson, Thomas, M.A. (California), Oregon State Agricultural College, Department of Chemistry, Corvallis, U.S.A.
- 1917 Watt, Joseph James, B.Sc. (Lond.), Messrs. Bass, Ratcliffe & Gretton, Burton-on-Trent.
- 1919 Watterson, James Horatio, B.Sc. (Lond.), Braeside, Magdale, Honley, Huddersfield.
- 1919 Watterson, Norman Frederick, B.Sc. (Lond.), Kirk Ella, Constitution Hill, Wellington, Salop.
- 1920 Watts, Hugh Gower, A.R.C.S., 31, Queens Road, Beckenham, Kent.
- 1918 Wearing, Cyril Murray, B.Sc. (Birm.), Brampton Rise, 19, Frant Road, Tunbridge Wells, Kent.
- 1918 Weaver, William, B.Sc. (Manc.), The Lodge, 285, Birchfield Road, Perry Barr, Birmingham.
- 1919 Weaving, Archibald Arthur, B.Sc. (Birm.), 53, Mayfield Road, Moseley, Birmingham.
- 1917 Webb, Henry Marshall, B.Sc. (Lond.), Épargne, Avenue des Phares, Paris Plage, Pas de Calais, France.
- 1918 Webster, Thomas Arthur, National Institute for Medical Research, Mount Vernon, Hampstead, London, N.W.
- 1921 Wedgwood, Gordon, A.C.G.F.C., 245, Cherryhinton Road, Cambridge.
- 1918 Weeks, Frederick William, 270, Blackburn Road, Edgworth, near Bolton.
- 1921 Weighell, Arthur, 31, The Avenue, Consett, Co. Durham.
- 1919 Weil, Victor Maurice, B.Sc. (Lond.), Rokesley Lodge, St. George's Road, Kempdown, Brighton, Sussex.
- 1918 Weir, Alexander Bertram, B.Sc. (Edin.), The Hull Oil Manufacturing Co., Ltd., Stoneferry, Hull.
- 1919 Weiss, Augustus Frederick, B.Sc. (Lond.), Sandown Villa, Benhill Road, Sutton, Surrey.

- 1918 Welch, Marcus Baldwin, B.Sc. (Sydney), Technological Museum, Sydney, Australia.
- 1918 Welch, Sidney Arthur, B.Sc. (Lond.).
- 1916 Wells, Ernest Edmund, B.Sc. (Lond.), British Dyestuffs Corporation, Blackley, Manchester.
- 1918 Welsford, Giles Hadden, 33, Delamare Mansions, London, W. 9.
- 1918 West, Donald Willoughby Capon, A.C.G.I., Slinfold, Horsham, Sussex.
- 1918 West, Joseph Dominic Francis, Lincoln College, Oxford.
- 1918 West, Ralph Winton, A.R.C.S., 203, Casewick Road, W. Norwood, London, S.E. 27.
- 1918 Westman, Le Roy Egerton, M.A. (Toronto), Editor, *Canadian Chemical Journal*, 72, Queen Street, W., Toronto, Canada.
- 1918 Weston, Edmund Percy, B.Sc. (Dun.), 43, North View Terrace, Benwell, Newcastle-on-Tyne.
- 1918 Whalley, George William, M.Sc. (Manc.), Grammar School, Cirencester, Glos.
- 1920 Whalley, Hubert Charles Siegfried de, The Laboratory, The Molassine Co., Ltd., Tunnel Avenue, Greenwich, London, S.E. 10.
- 1918 Wheatley, Arnold Herbert Maurice, B.Sc. (Leeds), The Chemical Laboratory, Cardiff City Mental Hospital, Whitechurch, near Cardiff.
- 1919 Wheatley, Henry, junr., B.Sc. (Lond.), Government Quinine Factory, Naduvatam, Madras, India.
- 1918 Wheatley, William, M.A. (Oxon), 63, Flanders Mansions, Bedford Park, London, W. 4.
- 1917 Wheeler, Edward, A.C.G.I., Sefton, 117, Main Road, Sidcup, Kent.
- 1920 Wheeler, Thomas Sherlock, A.R.C.Sc.I., Main Laboratory, R.N. Cordite Factory, Holton Heath, nr. Wareham, Dorset.
- 1919 Wheeler, Walter Charles Gordon, B.Sc. (Q.U.I.), c/o Messrs. Leacock & Co., Ltd., Madeira.
- 1920 Whelan, Peter, A.R.C.Sc.I., Royal College of Science for Ireland, Dublin.
- 1919 Whinyates, Leonard, A.M.C.T., 27, Daresbury Road, Chorlton-cum-Hardy.
- 1918 Whitaker, Arnold, B.Sc., A.R.C.S. (Lond.), D.I.C., The Royal Naval Cordite Factory, Holton Heath, Dorset.
- 1919 Whitaker, Herbert, M.Sc. (Leeds), A.M.C.T., c/o Rustless Iron Co., Ltd., Trico Works, Keighley, Yorks.
- 1921 Whitaker, John Wilfrid, B.Sc. Eng. (Lond.), University College, Nottingham.
- 1919 Whitaker, Joseph Edward Firth, B.A. (Cantab.), B.Sc. (Lond.), Sheffield City Training College for Teachers, Collegiate Crescent, Sheffield.
- 1918 Whitaker, Roland Stead, B.Sc. (Sheff.), Bellevue, 114, Teignmouth Road, St. Marychurch, Torquay.
- 1917 White, Albert Greville, B.Sc. (Wales), Roselea, 37, Argyle Road, Saltcoats, Ayrshire.
- 1910 White, Charles Josiah, B.Sc. (Syd.), The Training College, Sydney, N.S.W., Australia.
- 1920 White, George Frederic, B.Sc. (Lond.), 4, Eversleigh Road, East Ham, London, E. 6.

- 1918 White, John William, B.Sc. (Lond.), c/o E.C. Powder Co., Ltd., Green Street Green, Dartford, Kent.
- 1919 Whitfeild, Bernard Wyndham, Gordon College, Khartoum.
- 1918 Whitham, Harry, 11, Stanley Road, New Ferry, Birkenhead.
- 1920 Whitmore, Charles James Richard, M.A. (Cantab.), The Cambridge and County School, Hills Road, Cambridge.
- 1918 Whittaker, Croyden Meredith, B.Sc. (Vict.), 39, Albert Road, Cheadle Hulme, Manchester.
- 1919 Whitton, William Alexander, B.Sc. (Vict.), M.Sc. (Liv.), The County Secondary School, New Mills, nr. Stockport.
- 1918 Whitworth, Cecil William, A.C.G.I., 11, St. Andrew's Road, Bedford.
- 1919 Whitworth, James Bell, B.Sc. (Wales), 2, Church Street, Lampeter, Cardigan.
- 1917 Wignall, Harry, M.Sc. (Manc.), 16, Roseneath Road, London, S.W. 11.
- 1919 Wikner, Sigurd Albert Walfrid, The Newcastle-on-Tyne and Gateshead Gas Co., By-Products Works, St. Anthony's, Newcastle-on-Tyne.
- 1918 Wilde, William, Brooklyn, Hapton, near Burnley.
- 1919 Wilford, Arthur Thomas, B.Sc., A.R.C.S. (Lond.), 102, Denmark Road, London, S.E. 5.
- 1918 Wilkie, Arthur Leslie, 6, Wellington Villas, Arundel Street, Nottingham.
- 1917 Wilkins, Charles Reginald, B.Sc. (Lond.), 8, Crookston Road, Eltham, London, S.E. 9.
- 1919 Wilkinson, Edward John, 16, Hanover Gardens, Higher Broughton, Manchester.
- 1918 Wilkinson, Harry, Dept. of Dyeing, Technical College, Huddersfield.
- 1920 Wilkinson, John Frederick, B.Sc. (Vict.), Holmwood, Davenport Park, Stockport.
- 1921 Williams, Aneurin, M.Sc. (Liv.), 57, Frederick Street, Widnes.
- 1918 Williams, Charles Gordon, B.Sc. (Lond.), Technical Institution, Victoria Road, Swindon, Wilts.
- 1917 Williams, David Emrys, B.Sc. (Wales), Bryn Awel, Bryn, near Corwen, North Wales.
- 1919 Williams, Edward Thomas, M.Sc. (Liv.), 116, Well Lane, Higher Tranmere, Birkenhead, Cheshire.
- 1919 Williams, Edwin, B.Sc. (Lond.), c/o Associated Belting Companies, Ltd., 9, St. Thomas Street, London, S.E. 1.
- 1917 Williams, Evan Clifford, M.Sc. (Manc.), 130, Fitzwilliam Street, Huddersfield.
- 1920 Williams, Ewart Harrod, A.C.G.I., 31, Thornsbeach Road, Catford, London, S.E. 6.
- 1918 Williams, Frederick, M.A. (Oxon), Bute Villa, Aberdare.
- 1921 Williams, Harold Bishop, Ashley, 6, Hamlet Road, Upper Norwood, London, S.E. 19.
- 1918 Williams, Harold Wanson, B.Sc. (Wales), Heathfield, Risca, Mon.
- 1918 Williams, Harry, Fairfield Willows, S. Benfleet, Essex.

- 1919 Williams, Harry, B.Sc. (Manc.), 78, The Rand, Eastriggs, Dumfries-shire.
- 1918 Williams, Henry James, B.Sc. (Wales), 9, Greenhill Avenue, Tenby, S. Wales.
- 1918 Williams, John Guilfoyle, B.Sc. (Lond.), 2, Melbourne Road, West Bridgford, Notts.
- 1918 Williams, Percy Noel, M.Sc. (Liv.), 23, Stuart Road, Birkenhead.
- 1919 Williams, Vernon Harcourt, B.Sc. (Wales), 31, South Beach Avenue, Ardrossan, Ayrshire.
- 1918 Williams, Walter Beynon, B.Sc. (Wales), Eastholme, Charlton Road, Shepton Mallet, Somerset.
- 1919 Williams, William, B.Sc. (Lond.), 14, Maurice Road, St. Andrew's Park, Bristol.
- 1920 Williams, William Henry, M.A. (Cantab.), 6, Belgrave Road, Leyton, London. E. 10.
- 1917 Williamson, William Turner Horace, B.Sc. (Aberd.), College of Agriculture, 13, George Square, Edinburgh.
- 1918 Willson, Francis George, B.Sc. (Lond. and Bris.), Department of Explosives Research, Royal Arsenal, Woolwich, London, S.E. 18.
- 1918 Willstrop, John William Wesley, B.Sc. (Birm.), Wargrave, Fellows Road, S. Farnborough, Hants.
- 1919 Wilson, Alan Forsyth, B.Sc. (Dun.), 2, Burdon Place, Newcastle-on-Tyne.
- 1920 Wilson, Donald Cumming, B.Sc. (Edin.), 5, Hope Place, Tranent, East Lothian.
- 1918 Wilson, Donald Major, M.C., Fairlight, 53, Clarendon Road, Lewisham, London, S.E. 13.
- 1919 Wilson, Ernest Percival, M.Sc. (Leeds), Coney Moor, Methley, near Leeds.
- 1921 Wilson, Ernest Perry Bradley, B.Sc. (Birm.), Wilton House, Park Crescent, Erith, Kent.
- 1917 Wilson, Fred Ernest, B.Sc. (Lond.), St. Heliers, Beswick Avenue, Ensbury Park, Winton, Bournemouth.
- 1919 Wilson, James Herbert, 40, Western Road, Cowlersley, Huddersfield.
- 1919 Wilson, John, M.Sc. (Vict.), Apsley House, Heywood Street, Bury, Lancs.
- 1919 Wilson, Stanley Pierce, M.Sc.Tech. (Manc.), Heald House, Rusholme, Manchester.
- 1918 Wilson, William John, A.C.G.I., Fair Lawn, Honor Oak Road, Forest Hill, London, S.E. 23.
- 1920 Winch, Miss Hope Constance Monica, 27, Sidney Grove, Newcastle-on-Tyne.
- 1918 Winnill, Thomas Field, B.A. (Oxon), B.Sc. (Lond.), c/o R. Clarke, Esq., Elbury, Worcester.
- 1921 Winter, Ramsay Middleton, M.Sc. (N.Z.), 11, Boughton Road, Well Hall, Eltham, S.E. 9.
- 1918 Wintle, Albert Watkins Maggs, 170, Newbridge Road, St. Anne's Park, Bristol.

- 1918 Wisbey, Ewart Osmond, B.Sc. (Wales), 60, Bankfield Road, Manchester Road, Huddersfield.
- 1921 Wiseman, Cecil Edgar, A.C.C.F.C., 38, Wellwood Road, Goodmayes, Ilford, Essex.
- 1918 Wiseman, Harry, M.A., B.Sc. (Aberd.), Kinloch, Cairns Road, Cambuslang, Glasgow.
- 1919 Wishart, Robert Scott, M.A., B.Sc. (Edin.), 10, Wilton Avenue, Sedgely Park, Fife.
- 1919 Withers, John Charles, Ph.D. (Würzburg), Shirley Institute, Didsbury, Manchester.
- 1918 Wolfe, Harold Maurice, M.Sc. (Leeds), Broomhurst, 12, Chapel Lane, Headingley, Leeds.
- 1919 Wolff, Lewis Smaje, B.Sc. (Lond.). The Hotel, Amanrimitoti, South Coast, South Africa.
- 1917 Wood, Arthur Samuel, B.Sc. (Lond.), Municipal Technical School, Leicester.
- 1919 Wood, Cecil William, Government Analytical Laboratory, Cairo, Egypt.
- 1918 Wood, Charles Edmund, M.Sc. (Birm.), The University, Edgbaston, Birmingham.
- 1920 Wood, Miss Florence Mary, B.Sc. (Lond. and Birm.), Belgrave House, 6/7, Montague Street, London, W.C. 1.
- 1921 Wood, Cyril Christian, B.Sc., A.R.C.S. (Lond.), 94, Park Avenue South, Crouch End, London, N. 8.
- 1919 Wood, Frederick Charles, B.Sc. (Lond.), Research Department, Messrs. Tootal, Broadhurst, Lee Co., Ltd., Oxford Street, Manchester.
- 1918 Wood, James William, M.Sc.Tech. (Mane.), The Fuel Dept., The University, Leeds.
- 1920 Wood, Robert, B.Sc. (Dum.), Quarry House, Dudley, Wores.
- 1919 Wood, William, 71, High Street, Waltham Cross.
- 1918 Woodhead, Arthur Edmund, M.Sc. (Leeds), Bernerside, Cornwall Road, Harrogate.
- 1920 Woodhead, Miss Gertrude Ramsden, B.Sc. (Leeds), Sneaton Castle, Whitby, Yorks.
- 1917 Woodmansey, Arnold, B.Sc. (Leeds), 8, Church Avenue, Skipton Road, Harrogate.
- 1921 Woodroffe, David, B.Sc. (Leeds), 13, Primrose Hill, Northampton.
- 1919 Woods, Greatrex Johnson, E.L.C.O. Works, 70, Dudden Hill Lane, Willesden, London, N.W. 10.
- 1920 Woods, Norman Edward, A.R.C.S., c/o Messrs. W. E. Woods, Ltd., Manufacturing Chemists, Collins Street, Surrey Hills, Sydney, Australia.
- 1921 Woodward, Miss Elsie, 17, Bloomsbury Square, London, W.C. 1.
- 1918 Woodworth, William Fitzgerald, A.R.C.Sc.I., 63, Kenilworth Square, Rathgar, Dublin, Ireland.
- 1921 Woolf,† Sidney Samuel, B.Sc. (Lond.), The Technical College, Loughborough.

1920	Woollard, Richard Pargeter, A.R.C.S., 175, The Grove, Denmark Hill, London, S.E. 5.
1919	Wootton, Fred, B.Sc. (Lond.), Dudley Road, Ashford, Middlesex.
1918	Worcester, Darcy, B.Sc. (Lond.).
1921	Workman, Miss Olive, M.Sc. (Lond.), 15, Ribblesdale Road, Hornsey, London, N. 8.
1921	Wormall, Arthur, B.Sc. (Leeds), 20, Ashville View, Cardigan Road, Leeds.
1920	Worsdale, John Everard, A.R.C.S., 6, Park Road, Park Street, Hull.
1919	Wright, Allister Maclean, P.O. Box 617, Christchurch, New Zealand.
1918	Wright, Charles, B.Sc. (Leeds), 53, Shaftesbury Road, Gosport.
1918	Wright, Miss Winifred, B.Sc. (Birm.), c/o Messrs. Johnson & Sons, Manufacturing Chemists, Ltd., Hendon Works, Renters Avenue, Hendon, London, N.W. 4.
1920	Wright, Robert Norman, B.Sc., A.R.C.S. (Lond.), 16, Redcliffe Street, London, S.W. 10.
1917	Wynn, William Owen Roderick, Oaklands, The Avenue, Worcester Park, Surrey.

Y

1919	Yajnik, Narbheshanker Amarji, M.A. (Bombay), Forman Christian College, Lahore, India.
1919	Yarrow, George Ernest, B.Sc. (Dun.), 15, Sedgley Avenue, Sedgley Park, Manchester.
1919	Yeats, Howard, B.Sc. (Lond.), 3, Clock House Road, Beckenham, Kent.
1917	Young, James, c/o Messrs. A. Wander & Co., Ovaltine Works, King's Langley, Herts.
1918	Young, Roland Francis, 2, Aberdeen House, Kenton Street, Russell Square, London, W.C. 1.
1918	Young, William, M.A., B.Sc. (St. Andrews), Toorak, South Beach, Salt-coats, Ayrshire.

Z

1918 Zealley, Alec Thomas Sharland, M.Sc. (Lond.), Coly Mills, Colyton,
Devon.

NUMBER OF ASSOCIATES	1841
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SUMMARY OF MEMBERS.

Fellows	1571
Associates	1841
									3412

STUDENTS.

After each Student's name is given, in brackets, that of the Fellow who signed his Application Form, or that of the College from which he applied.

A

- 1919 Adams, Basil Albert, Lynwood, 43, Cromwell Road, Beckenham, Kent.
(H. B. Brown, F.I.C.)
- 1921 Adamson, James Henry, Oaklands, Bebington, Cheshire.
(The Sir John Cass Technical Institute, London.)
- 1920 Adcock, Roland Eric, 69, High Street, Syston, Leicester.
(University College, Nottingham.)
- 1921 Alexander, James Dickson, 11, Wellington Street, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1920 Allam, Joseph Dobson, Lynton, Heathcote Grove, Chingford, London, E. 4.
(T. F. Harvey, F.I.C.)
- 1919 Allen, Hamish, 6, West Heath Drive, Golders Green, London, N.W. 3.
(University College, London.)
- 1921 Allan, John, 189, St. Andrew's Road, Pollokshields, Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Allsop, Fred, B.Sc. (Sheff.), School House, Outwell, Wisbech.
(The University of Sheffield.)
- 1920 Ambler, Henry Reason, 45, Clifford Road, East Finchley, London, N. 2.
(University College, London.)
- 1919 Anderson, Alexander Ross, Alexander Cottage, Uddingston, Lanarkshire.
(Royal Technical College, Glasgow.)
- 1921 Anderson, James Thomson, 126, Lawford Road, N.B., Rugby.
(The University of Birmingham.)
- 1920 Anderson, William Richardson, 3, Derwentwater Terrace, South Shields.
(Armstrong College, Newcastle-on-Tyne.)
- 1920 Andrew, Alexander, 26a, Waterside, Irvine, Ayrshire.
(Royal Technical College, Glasgow.)
- 1921 Andrews, Frederick William, 93a, St. Paul's Road, Camden Square, London, N.W. 1.
(S. Gordon Liversedge, F.I.C.)
- 1918 Angus, George Bagrie, 24, Clarence Street, Edinburgh.
(King's College, London.)
- 1920 Armour, Miss Janet Foote, 55, Gardner Street, Partick, Glasgow.
(The University, Glasgow.)
- 1920 Armour, John, 55, Gardner Street, Partick, Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Arundale, Leslie, 92, Slade Lane, Longsight, Manchester.
(W. D. Rogers, B.Sc., A.R.C.S., F.I.C.)

- 1918 Asdell, Sydney Arthur, St. Catherine's College, Cambridge.
(Municipal Technical School, Birmingham.)
- 1920 Ashman, Harold, 8, High Street, Netherton, near Dudley.
(The University of Birmingham.)
- 1921 Ashmore, James Ernest, 183, Eeelesall Road, Sheffield.
(The University of Sheffield.)
- 1920 Atherley, Samuel Walter, 86, Front Street, Arnold, Notts.
(University College, Nottingham.)
- 1921 Austin, Reginald George, 23, Exmoor Road, Southampton.
(University College, Southampton.)
- 1918 Aweock, George Alee, 26, Blenheim Crescent, South Croydon, Surrey.
(Finsbury Technical College, London.)
- 1918 Ayling, Ernest Edward, B.Sc. (Lond.), Argyle, Woodthorpe Road,
Ashford, Middlesex.
(King's College, London.)

B

- 1920 Baek, Sydney, 179, Belsize Road, Kilburn, London, N.W. 6.
(T. F. Harvey, F.I.C.)
- 1921 Bagnall, Douglas James Talbot, 57, Alexandra Road, Reading.
(Finsbury Technical College, London.)
- 1919 Baguley, Noel Gregory, 23, The Park, Newark-on-Trent.
(University College, Nottingham.)
- 1918 Bailey, Wilfred Arthur, 16, Heathwood Gardens, Old Charlton, London,
S.E. 7.
(Sir Robert Robertson, K.B.E., F.R.S., F.I.C.)
- 1916 Baines, Edward Robinson, 99, Eastgate, Louth, Lincs.
(School of the Pharmaceutical Society.)
- 1920 Baines, Harry, 22, Henry Road, West Bridgford, Notts.
(University College, Nottingham.)
- 1920 Baird, James, 1, Arran View, Beith, Ayrshire.
(Royal Technical College, Glasgow.)
- 1920 Baker, Charles Frederiek, 88, Hertford Road, East Finchley, London,
N. 2.
(Finsbury Technical College, London.)
- 1916 Bakes, William Edgar, Westkirk, The Triangle, Lower Parkstone,
Dorset.
(The University, Leeds.)
- 1920 Bakewell, Ernest, 9, Woodhouse Street, Nottingham.
(University College, Nottingham.)
- 1920 Balfour, Robert Paterson, 4, Forbes Terrace, Kirkealdy, Fife.
(Heriot-Watt College, Edinburgh.)
- 1921 Banfield, Francis Harold, 40, Maryland Road, Wood Green, London,
N. 22.
(Battersea Polytechnic, London.)
- 1919 Banks, Bernard George, 46, Montalt Road, Woodford Green, Essex.
(Finsbury Technical College, London.)

- 1919 Bannister, Cyril Bradley, Spout House, Lightcliffe, Yorks.
(Technical College, Huddersfield.)
- 1921 Barker, Leslie Herbert, 28, Grafton Road, Handsworth, Birmingham.
(E. W. Mann, B.Sc., F.I.C.)
- 1918 Barklie, Robert Henry Douglas, Penton Lodge, Old Lodge Lane,
Purley, Surrey.
(King's College, London.)
- 1920 Barnes, Alfred Raymond, 30, Highfield Road, West Bridgford, Notts.
(University College, Nottingham.)
- 1921 Barnett, Roland, 199, Thorold Road, Ilford, Essex.
(East London College, London.)
- 1919 Barr, William, 100, Mysore Road, Lavender Hill, London, S.W. 11.
(E. V. Evans, O.B.E., F.I.C.)
- 1907 Barry, William Redmond, 86, Oakley Street, Chelsea, London, S.W. 3.
(Royal Technical College, Glasgow.)
- 1921 Bartlett, Arthur, 9, Cambridge Street, Hull.
(G. E. Johnson, B.Sc., F.I.C.)
- 1919 Bartlett, Cecil Atley, 71, Salisbury Road, Harrow, Middlesex.
(South-Western Polytechnic, London.)
- 1921 Baskett, Ronald Gilbert, 121, London Road, Reading.
(University College, Reading.)
- 1921 Bassett, Henry Norman, 118, Dixon Street, Swindon, Wilts.
(Thomas Hartley, B.Sc., F.I.C.)
- 1921 Bate, Frank Harold, 25, Moor Lane, Whitton, Birmingham.
(J. A. Newton Friend, D.Sc., Ph.D., F.I.C.)
- 1918 Bateman, Edgar William, 525, Canterbury Street, Gillingham, Kent.
(East London College, London.)
- 1920 Bates, Henry Hutchinson, 179, Springvale Road, Sheffield.
(The University of Oxford.)
- 1919 Bates, William Ralph, 39, London Road, Newcastle, Staffs.
(Imperial College of Science and Technology, London.)
- 1920 Baylis, Charles Edmund, 13, Bridge Road, East Ham, London, E. 6.
(The Sir John Cass Technical Institute, London.)
- 1919 Beardsley, Arnold Reginald, 4, Oxford Street, Long Eaton, near
Nottingham.
(University College, Nottingham.)
- 1919 Beardwood, Frank, Barton, Fulwood Hall Lane, Fulwood, Preston.
(Municipal Technical School, Blackburn.)
- 1916 Beck, Clarence Walter, 240, Meanwood Road, Leeds.
(The University of Leeds.)
- 1915 Beecroft, Sydney Bowers, 12a, Mariners Terrace, Dewsbury Road,
Leeds.
(A. R. Smith, M.Sc., F.I.C.)
- 1920 Belcher, Kenneth Booth, 10, Stoats Nest Road, Coulsdon, Surrey.
(F. W. Passmore, Ph.D., F.I.C.)
- 1920 Bell, Herbert Vincent, Scencliff, Redcar Road, South Banks, Yorks.
(Armstrong College, Newcastle-on-Tyne.)
- 1919 Bell, James Richard, 14, Ryehill Grove, Leith.
(Heriot-Watt College, Edinburgh.)

- 1920 Bellerby, Charles William, Christ's College, Cambridge.
(The University of Cambridge.)
- 1921 Bender, Gustave William, 31, Honiton Road, Brondesbury, London,
N.W. 6.
(The Sir John Cass Technical Institute, London.)
- 1920 Bennett, Miss Hilda, 423, Addison House, Grove End Road, London,
N.W. 8.
(The Sir John Cass Technical Institute, London.)
- 1920 Benson, Edward James, 2, Kemble Street, Prescott, Lancs.
(F. J. Brislee, D.Sc., F.I.C.)
- 1921 Benson, Gwyn, Maesyllfynon, Merthyr Road, Pontypridd.
(J. G. Lord, M.A., F.I.C.)
- 1916 Benstead, Thomas Bruce, Plomont, Grovehall Drive, Beeston, Leeds.
(The University of Leeds.)
- 1917 Bentley, Thomas Leslie James, 5, Fairlawn Road, Wimbledon, London,
S.W. 19.
(Imperial College of Science and Technology, London.)
- 1921 Berchem, Rudolph Otto George Alexander, 3, Casewick Road, West
Norwood, London, S.E. 27.
(Birkbeck College, London.)
- 1920 Best, John Kenneth, 8, Sycamore Road, Bournville, Birmingham.
(N. P. Booth, F.I.C.)
- 1920 Bevan, Robert Grey, Woodlands, Gowerton, Swansea.
(University College, Aberystwyth.)
- 1920 Bigelstone, Herbert James, 24, Freehold Street, Loughborough,
Leicestershire.
(Arthur Bramley, D.Sc., A.R.C.S., F.I.C.)
- 1919 Biggs, George Henry, Mortlake, 15, Leeds Road, Seven Kings, Essex.
(Finsbury Technical College, London.)
- 1919 Bilham, Philip Leo, 66, Culverden Road, Balham, London, S.W. 12.
(South-Western Polytechnic, London.)
- 1920 Bilton, Ralph Moulton, Sizer Hill, Yeadon, Leeds.
(Robert Gawler, M.Sc., F.I.C.)
- 1919 Birch, Stanley Francis, 28, Marloes Road, Kensington, London, W. 8.
(Imperial College of Science and Technology, London.)
- 1907 Black, Angus David, c/o Messrs. Nobel's Explosives Co., Ltd., Ardeer
Factory, Stevenston, Ayrshire.
(Royal Technical College, Glasgow.)
- 1920 Black, Munro David, Kinnoull, Busby, near Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Blackie, Joseph John, c/o Messrs. Duncan, Flockhart & Co., 104,
Holyrood Road, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1921 Blacktin, Samuel Cyril, 23, Walton Road, Sheffield.
(The University of Sheffield.)
- 1918 Blakey, Robert Fitzjohn Wood, 17, Melville Terrace, Stirling, Scotland.
(F. G. Edmed, O.B.E., B.Sc., F.I.C.)
- 1920 Blount, Reginald Willis, 21, Buller Street, Derby.
(Leonard Archbutt, F.I.C.)

- 1920 Blunsden, Archibald Beresford, The Bungalow, Stoke Lane, Westbury-on-Trym.
(Merchant Venturers Technical College, Bristol.)
- 1920 Blyth, Jabez George, Engineers House, St. Mary's Silk Mills, Norwich.
(Huddersfield Technical College.)
- 1917 Bockett, Eric John Cuming, Naseby, 89, King Charles's Road, Surbiton Surrey.
(King's College, London.)
- 1920 Boorer, Joseph Roy, 7, Gabriel Street, Honor Oak Park, London, S.E. 23.
(Sir John Cass Technical Institute, London.)
- 1920 Booth, Walter, Brookdale, Ferrybridge, Yorks.
(Central Technical School, Leeds.)
- 1920 Bostock, Alfred, 79, Kingsway, Ilkeston, Derbyshire.
(University College, Nottingham.)
- 1915 Bothamley, Richard Parkinson, Fernhurst, Gregory Boulevard, Nottingham.
(University College, Nottingham.)
- 1921 Boudry, Cyril, 23, Esplanade Place, Whitley Bay, Northumberland.
(H. J. Young, F.I.C.)
- 1919 Bovill, Percy James Clarke, Millandraeth, Pentire, Newquay, Cornwall.
(The University, Sheffield.)
- 1921 Bowden, Sydney Thomas, The Emporium, Seven Sisters, Glam.
(University College, Cardiff.)
- 1920 Bowyer, Stephen Bernard, 10, Penwortham Road, Streatham Park, London, S.W.
(Sir John Cass Technical Institute, London.)
- 1921 Box, Ronald John, Elcheater, Arthur Road, Slough.
(Finsbury Technical College, London.)
- 1920 Branch, Leslie Ernest Thomas, Delaval, The Drive, Snaresbrook, Essex.
(East London College, London.)
- 1920 Bray, Charles William, Moor Lane, Southwell, Notts.
(University College, Nottingham.)
- 1920 Brazier, William Ernest, 71, Waterloo Promenade, Forest Road, Nottingham.
(University College, Nottingham.)
- 1919 Brearley, George, 983, Hare Street, Romford, Essex.
(The University of Leeds.)
- 1920 Brice, Frederick Stanley Winston, 46, Hamilton Road, Felixstowe.
(King's College, London.)
- 1916 Bright, John Harold, Thornbury, Birmingham Road, West Bromwich.
(A. E. Tucker, F.I.C.)
- 1918 Brindle, Harry, 54, Cawdor Road, Fallowfield, Manchester.
(King's College, London.)
- 1916 Brisley, Charles William, 105, Thurlow Park Road, London, S.E. 21.
(University College, London.)
- 1919 Broom, Walter Alfred, 2, Dixworth Grove, Mundella Road, Nottingham.
(F. H. Carr, C.B.E., F.I.C.)
- 1920 Broughall, Laurence St. Clair, Woodview, Hadley, Barnet, Herts.
(University College, London.)

- 1920 Brow, William Thomas, 12, Ryehill Place, Leith, Scotland.
(Heriot-Watt College, Edinburgh.)
- 1920 Brown, Derek Goudie, 77, Mount Annan Drive, Cathcart, Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Brown, Francis Leonard Robert, 10, Coverdale Road, London, W. 12.
(South-Western Polytechnic, London.)
- 1917 Brown, Frederick Stanley, Rosebank, Tile Hill Lane, near Coventry.
(G. S. Heaven, B.Sc., F.I.C.)
- 1920 Brown, John, 38, Minto Street, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1921 Brown, Victor Charles, 28, Felday Road, Lewisham, London, S.E. 13.
(Sir John Cass Technical Institute, London.)
- 1920 Browne, Gerald Barton, 11, Northwick House, St. John's Wood Road, London, N.W. 8.
(Finsbury Technical College, London.)
- 1918 Browne, Rupert Pollard, 7, King Street, Richmond, Surrey.
(University College, London.)
- 1920 Bryan, William Stanger, 22, Faircross Avenue, Barking, Essex.
(Sir John Cass Technical Institute, London.)
- 1920 Bryett, William Henry, 36, Dore Avenue, Manor Park, London, E. 12.
(Sir John Cass Technical Institute, London.)
- 1920 Budgen, Norman Frederick, Southbourne, Birchfield Road, Handsworth, Birmingham.
(The University of Birmingham.)
- 1921 Burdekin, John Thomas, 59, William Street, Sheffield.
(The University of Sheffield.)
- 1920 Burdett, Arthur Ernest Dixon, Meadow Croft, Burkes Road, Beaconsfield, Bucks.
(Imperial College of Science and Technology, London.)
- 1921 Burns, James Alexander, 22, Townsend Place, Kirkcaldy, Fife.
(Heriot-Watt College, Edinburgh.)
- 1920 Burns, Robert, 49, Kilmahew Street, Ardrossan, Scotland.
(William Rintoul, O.B.E., F.I.C.)
- 1919 Burton, Harold, M.Sc. (Sheff.), 22, Barnsley Road, Wath-on-Deerne, near Rotherham, Yorks.
(The University of Sheffield.)
- 1918 Burt, Arnold Wigham, 73, Linden Road, Bournville, Birmingham.
(N. P. Booth, F.I.C.)
- 1921 Bushill, John Herbert, 61, Bowyer Road, Alum Rock, Birmingham.
(The University of Birmingham.)
- 1920 Butler, Edwin Harold, 26, St. James Road, Leicester.
(Ellis Clayton, F.I.C.)
- 1914 Butler, Franz Herbert Culverhouse, South End, St. Cross, Winchester.
(The University, Cambridge.)
- 1909 Buttrick, Harold Pease, 15, Braemar Avenue, Wood Green, London, N. 22.
(F. W. Richardson, F.I.C.)

C

- 1920 Callingham, William Ernest, 11, Matthews Street, Battersea, London, S.W. 11.
(W. G. Whiffen, F.I.C.)
- 1921 Calvert, Harry Shaw, Wagaraw, Greenhead Road, Huddersfield.
(Technical College, Huddersfield.)
- 1920 Caminsky, Abraham, Magadi Soda Works, Lake Magadi, British East Africa.
(H. W. Gill, B.Sc., F.I.C.)
- 1916 Campbell, Hugh Hannay, 3, Winton Place, Tranent, Scotland.
(Heriot-Watt College, Edinburgh.)
- 1921 Cantelo, Herbert Reginald, B.Sc. (Lond.), 39, Norfolk Road, Southampton.
(University College, Southampton.)
- 1919 Carey, Cecil Ernest, 59, Harefield Road, Brockley, London, S.E. 4.
(E. V. Evans, O.B.E., F.I.C.)
- 1914 Carlisle, William Foster, 12, Northumberland Road, Sheffield.
(The University of Sheffield.)
- 1920 Carmichael, Kenneth Francis, Fetteresk, Penicuik, Midlothian.
(Heriot-Watt College, Edinburgh.)
- 1920 Carroll, Michael Francis, 167, Upper Wickham Lane, Welling, Kent.
(Sir Robert Robertson, K.B.E., F.R.S., F.I.C.)
- 1914 Carson, Samuel David, 20, York Street, Ayr.
(Royal Technical College, Glasgow.)
- 1920 Carter, John Stanley, Holly Farm, Farnley, Leeds.
(The University of Leeds.)
- 1919 Caswell, Arthur Edward, St. Heliers, 30, Maidstone Road, Chatham.
(King's College, London.)
- 1921 Catchpole, Percival Arthur, St. Heliers, Masons Hill, Bromley, Kent.
(L. H. Lampitt, D.Sc., F.I.C.)
- 1920 Catton, Eric Draycott, Beeston, Swaffham, Norfolk.
(The University of Birmingham.)
- 1916 Causer, Laurence William, 123, Ordnance Road, Enfield Wash, London, N.
(G. F. Morrell, Ph.D., B.Sc., F.I.C.)
- 1920 Cawston, David George, 16, Highbury Crescent, London, N. 5.
(Sir John Cass Technical Institute, London.)
- 1921 Challans, Frank Bertrand, 74, Plane Street, Hull.
(G. E. Johnson, B.Sc., F.I.C.)
- 1920 Challis, William, 130, Ayres Road, Old Trafford, Manchester.
(W. D. Rogers, Esq., B.Sc., A.R.C.S., F.I.C.)
- 1919 Chaplin, Rufus, Ravenswood, 339, Brixton Road, London, S.W. 9.
(King's College, London.)
- 1919 Chapman, Mrs. Lillian Georgina, 15, Carlyle Mansions, Cheyne Walk, Chelsea, London, S.W. 3.
(South-Western Polytechnic, London.)
- 1920 Chapman, William Ronald, 323, Granville Road, Sheffield.
(The University of Sheffield.)

- 1920 Chater, Trevor Walter James, 9, Norman Terrace, Street Lane, Roundhay, Leeds.
(B. A. Burrell, F.I.C.)
- 1921 Childs, George Edward, Glevum Villa, Ferndale, Glam.
(S. R. Illingworth, A.R.C.S., F.I.C.)
- 1920 Chilvers, Percy Monkman, 53, Caledon Road, Sherwood, Nottingham.
(University College, Nottingham.)
- 1921 Churchman, Arthur, 14, Runcorn Road, Balsall Heath, Birmingham.
(The University of Birmingham.)
- 1920 Clark, Geoffrey Meeker, The Rectory, Farnley, Leeds.
(The University of Cambridge.)
- 1918 Clarke, Barri Ernest, 177, Anglesey Road, Burton-on-Trent.
(C. G. Matthews, F.I.C.)
- 1921 Clarkson, Ernest Lickiss, 2, South Avenue, Londesborough Street, Hull.
(G. E. Johnson, B.Sc., F.I.C.)
- 1919 Claudet, Richard Arthur Ormerod, 41, Brunswick Square, Hove, Sussex.
(King's College, London.)
- 1920 Clayton, Cyril James, 21, Upper Westbourne Terrace, Hyde Park, London, W. 2.
(South-Western Polytechnic, London.)
- 1919 Clear, Harry Norman, Treskerby, Curtis Road, Hornchurch, Essex.
(East London College, London.)
- 1920 Cleland, David Picken, 38, Viewpark Drive, Rutherglen, Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Clements, George Stephen, 93, Durham Road, Plumstead, London, S.E. 18.
(Imperial College of Science and Technology, London.)
- 1921 Clothier, George Leonard, 28, Grove Road, Surbiton, Surrey.
(Thomas Macara, F.I.C.)
- 1920 Coburn, Andrew, Pumpherston, Mid-Calder.
(Heriot-Watt College, Edinburgh.)
- 1921 Cochrane, Henry Alfred, 25, Pretoria Road, Plaistow, London, E. 13.
(W. B. Edwards, F.I.C.)
- 1919 Cocks, Herbert Charles, 89, Cairo Road, Walthamstow, London, E. 17.
(Leo Taylor, F.I.C.)
- 1921 Cohen, Harris, 54, Rahere Street, Goswell Road, London, E.C. 1.
(Battersea Polytechnic, London.)
- 1920 Cole, Frederic, Prospect Place, Howden-le-Wear, Co. Durham.
(University College, Nottingham.)
- 1919 Coles, Thomas William, 36, Marsden Street, Barrow-in-Furness.
(H. B. Weeks, F.I.C.)
- 1920 Colley, Albert Thomas William, 260, Dawlish Road, Bournbrook, Birmingham.
(N. P. Booth, F.I.C.)
- 1921 Comrie, Alan Arthur Douglas, Flat E., 15, Vera Road, Fulham, London, S.W. 6.
(H. F. E. Hulton, F.I.C.)
- 1920 Conolly, Edward John Venn, 36, Appleton Gate, Newark, Notts.
(University College, Nottingham.)

- 1920 Cook, James Wilfred, 6, Snowbury Road, Fulham, London, S.W. 6.
(University College, London.)
- 1920 Cooke, Arthur Arnold, c/o Mrs. Haigh, 14, Upper George Street, Huddersfield.
(Technical College, Huddersfield.)
- 1917 Cooke, Francis Cyril, 16, Homefield Road, Wimbledon, London, S.W. 19.
(Imperial College of Science and Technology, London.)
- 1921 Cooler, Harold Frederick, 110, High Street, Ponders End, Middlesex.
(East London College, London.)
- 1919 Coomber, Henry Edward, 179, Ditchling Road, Brighton, Sussex.
(R. A. Cripps, F.I.C.)
- 1895 Cooper, Albert John Bullen, 80, Gloucester Road, South Kensington, London, S.W. 7.
(School of the Pharmaceutical Society, London.)
- 1909 Cooper, Henry Edward, 12, Cambridge Crescent, Edgbaston, Birmingham.
(The University of Birmingham.)
- 1919 Cooper, Horace, Jubilee Street, Clayton-le-Moors, Accrington.
(Municipal Technical School, Birmingham.)
- 1919 Cooper, Nevill Bernard Willis, 17, Azalea Road, Blackburn, Lanes.
(Municipal Technical School, Blackburn.)
- 1909 Cooper, William, Admiralty Chemist's Department, H.M. Dockyard, Portsmouth.
(Arnold Philip, B.Sc., A.R.S.M., F.I.C.)
- 1920 Corbet, Alexander Steven, Abbeystone House, Sidmouth Street, Reading.
(University College, Reading.)
- 1916 Corby, Frederick James, 102, Birmingham Road, Walsall.
(F. E. Thompson, A.R.C.S., F.I.C.)
- 1920 Corran, John William, 86, Upper Hill Street, Princes Park, Liverpool.
(The University of Liverpool.)
- 1920 Cotton, Frank Harriss, 30, Fairfield Road, Crouch End, London, N. 8.
(J. B. Hoblyn, A.R.C.S., F.I.C.)
- 1920 Coucher, Miss Amy Gladys, Northwick, Elms Lane, Sudbury, Harrow.
(Finsbury Technical College, London.)
- 1920 Coull, James, 2, Park Road, Aberdeen.
(J. F. Tocher, D.Sc., F.I.C.)
- 1921 Coulson, Alan George, 19, Gladwell Road, Stroud Green, London, W. 8.
(Thomas Macara, F.I.C.)
- 1920 Courtney, William Barry, 12, Caithness Road, Mitcham, Surrey.
(South-Western Polytechnic, London.)
- 1919 Cox, Albert Edward, 9, Lambolle Road, Belsize Park, London, N.W. 3.
(A. H. M. Muter, F.I.C.)
- 1920 Craddock, Thomas John, 38, Bushey Hill Road, Camberwell, London, S.E. 5.
(Sir John Cass Technical Institute, London.)
- 1921 Crawford, Aynsley, 5, The Hollies, Billingham, near Stockton-on-Tees.
(Armstrong College, Newcastle-on-Tyne.)

- 1915 Crawford, Archibald Barclay, Locher, Bridge of Weir, Renfrewshire.
(Royal Technical College, Glasgow.)
- 1918 Crawley, Miss Ailsa Victoria, 41, Wroughton Road, London, S.W. 11.
(Julian L. Baker, F.I.C.)
- 1920 Creasy, John James, 18, Kohat Road, Wimbledon, London, S.W. 19.
(South-Western Polytechnic, London.)
- 1920 Creasy, William George, 18, Kohat Road, Wimbledon, London, S.W. 18.
(South-Western Polytechnic, London.)
- 1920 Crombie, John James, The Laboratory, Pumpherston Oil Works,
Pumpherston, Mid Calder, Scotland.
(Heriot-Watt College, Edinburgh.)
- 1919 Crosbie-Oates, Raymond, The Chalet, Park West, Heswall, Cheshire.
(The University of Liverpool.)
- 1920 Cross, Alfred Ernest, 22, Ryland Street, Stratford-on-Avon.
(E. W. Mann, B.Sc., F.I.C.)
- 1920 Crossingham, John Harold, 29, Longbridge Road, New Barking, Essex.
(South-Western Polytechnic, London.)
- 1919 Cuckney, Malcolm, 22, Clements Road, Ilford, Essex.
(Sir John Cass Technical Institute, London.)
- 1916 Cunliffe, Percy Walmsley, 73, Waddington Road, Clitheroe, Lanes.
- 1920 Cunningham, Stanley William Branch.
(Heriot-Watt College, Edinburgh.)
- 1920 Curran, Hugh, 13, Mayor's Walk, Waterford, Ireland.
(Royal College of Science for Ireland, Dublin.)
- 1920 Currie, Robert Matthew Hamilton, Ashbourne, Barterholm, Paisley.
(The University of Glasgow.)
- 1908 Cutner, Morris, B.Sc. (Lond.), 82, Kingston Road, New Malden, Surrey.
(King's College, London.)
- 1920 Cutting, Cecil George, St. Hilda's, 47, Whitehall Park, London, N. 19.
(Imperial College of Science and Technology, London.)

D

- 1919 Dallimore, Thomas Warwick, 33, Trafalgar Road, Greenwich, London,
S.E. 10.
(South-Western Polytechnic, London.)
- 1921 Dalton, William Geoffrey, 50, Moring Road, Tooting Bee Common,
London, S.W. 17.
(C. E. Sage, F.I.C.)
- 1919 Davey, Walter Cecil, 1, Somerset Road, Erdington, Birmingham.
(D. F. Twiss, D.Sc., F.I.C.)
- 1917 Davey, Wilfrid Shacklock, 6, Clifton Terrace, High Street, Dovercourt.
(Professor W. R. Dunstan, C.M.G., F.R.S., F.I.C.)
- 1917 Davidson, George, Cardon, 41, Katharine Drive, S. Govan, Glasgow.
(F. W. Harris, F.I.C.)
- 1921 Davie, George Forbes, 102, Irvine Place, Aberdeen, Scotland.
(The University of Aberdeen.)
- 1920 Davies, John Edward, 106, Gordon Road, West Ealing, London, W. 13.
(Finsbury Technical College, London.)

- 1919 Davies, Miss Mary, B.Sc. (Birm.), c/o Messrs. W. Travers & Sons, Meeting Street, Wednesbury, Staffs.
(Thomas Stenhouse, junr., B.Sc., A.R.S.M., F.I.C.)
- 1921 Davies, Thomas Maldwyn, 17, Garth Road, Bangor, N. Wales.
(W. D. Rogers, B.Sc., A.R.C.S., F.I.C.)
- 1921 Dawson, Frederic Alan, 84, Trinity Road, Bridlington, Yorks.
(G. E. Johnson, B.Sc., F.I.C.)
- 1921 Dawson, Thomas Theodore, 17, Upper Grosvenor Road, Handsworth, Birmingham.
(The University of Birmingham.)
- 1916 Day, Frank, 15, Lansdowne Gardens, London, S.W. 4.
(W. R. E. Hodgkinson, C.B.E., Ph.D., F.I.C.)
- 1919 Dean, John Norman, The Birches, Durham Road, Bromley, Kent.
(King's College, London.)
- 1920 Dee, Thomas Pride, 24, Freehold Street, Loughborough.
(Arthur Bramley, D.Sc., A.R.C.S., F.I.C.)
- 1921 Dennington, Sidney Herman, 31, Hemberton Road, Stockwell, London, S.W. 9.
(C. A. Hackman, F.I.C.)
- 1913 Derbyshire, Sydney Frank, Straits Trading Co., Pulo-Brani, Singapore.
(The University of Sheffield.)
- 1920 Derrick, William, University College, Nottingham.
(University College, Nottingham.)
- 1920 Diamond, Albert Victor, 37, Claribel Street, Liverpool.
(The University of Liverpool.)
- 1916 Dickie, William Alexander, Kingsbury, Princess Drive, Borrowash, Derby.
(H. L. Lucking, Ph.D., F.I.C.)
- 1918 Dickes, Miss Winifred Esther, 60, Melbury Gardens, Wimbledon, London, S.W. 19.
(University College, London.)
- 1920 Dodds, Gilbert Elliot, Allerton, Liberton, Midlothian.
(Heriot-Watt College, Edinburgh.)
- 1920 Dodds, George Patrick, 42a, Bravington Road, Harrow Road, London, W. 9.
(Birkbeck College, London.)
- 1919 Dodman, Stanley Boone, 26, Bloomsbury Square, London, W.C. 1.
(School of the Pharmaceutical Society.)
- 1918 Doughty, Joseph Neatby, B.Sc. (Sheff.), 33, Clarkehouse Road, Broomhall, Sheffield.
(The University of Sheffield.)
- 1917 Douglas, Gordon Watson, Dunure, Westville Avenue, Ilkley, Yorks.
(The late Thomas Fairley, F.I.C.)
- 1920 Dow, William Thornton, The Cottage, Gilmerton, Mid-Lothian, Scotland.
(Heriot-Watt College, Edinburgh.)
- 1920 Doxey, Frederick William, 55, Richford Street, Hammersmith, London, W. 6.
(South-Western Polytechnic, London.)
- 1920 Drabble, Arthur Garnet, 13, Stamp Street, Sharrow, Sheffield.
(The University of Sheffield.)

- 1920 Driver, John Edmund, 43, Dovecot Lane, Beeston, Notts.
(University College, Nottingham.)
- 1917 Drummond, Arthur Johnstone, 4, Grantly Gardens, Shawlands, Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Drummond, John Neill, 70, Cambridge Road, Moseley, Birmingham.
(H. V. Potter, B.Sc., F.I.C.)
- 1919 Dunn, Maurice William, 7, Emerson Road, Harborne, Birmingham.
(Municipal Technical School, Birmingham.)
- 1911 Dyne, Godfrey Walter Goodwick, B.Sc. (Lond.), 326, Riverdale Avenue,
Yonkers, N.Y., U.S.A.
(University College, London.)

E

- 1921 Earney, Frederick Alexander, 141, Chesnut Road, Plumstead, London,
S.E. 18.
(Professor J. S. S. Brame, F.I.C.)
- 1921 Eastland, Cyril Jack, 76, High Street, Margate.
(School of the Pharmaceutical Society.)
- 1920 Eaton, Frederick John, 2, Atholl Place, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1920 Ecob, William Alfred, Tenedos, Cropwell Road, Radcliffe-on-Trent,
Notts.
(University College, Nottingham.)
- 1920 Edgerton, Herbert Ayre, 5, Rathcoole Parade, Hornsey, London, N. 8.
(A. E. Parkes, F.I.C.)
- 1918 Edmonds, Ronald Walter Quaife, 3, St. Margaret's Street, Rochester,
Kent.
(Birkbeck College, London.)
- 1921 Edwards, Owen Kempster, 6, Dacre Park, Lee, London, S.E. 13.
(G. H. Perry, O.B.E., A.R.C.S., F.I.C.)
- 1920 Egan, James Patrick, Clydemount, Hyde Road, Gorton, Manchester.
(College of Technology, Manchester.)
- 1921 Elder, Henry, 20, Warrender Park Road, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1919 Ellis, Percival Francis, 72, Mackintosh Place, Cardiff.
(University College, Cardiff.)
- 1919 Ellison, Charles Herbert, 13, Hodder Street, Accrington, Lancs.
(Technical School, Blackburn.)
- 1915 Ellison, Luke Ridley, Fernlea, Mapperley Plains, Nottingham.
(University College, Nottingham.)
- 1920 Emmott, Sidney, 37, Main Street, Crosshills, near Keighley.
(Technical College, Bradford.)
- 1920 Esdaile, Ralph Margrave, Upminster, The Drive, Coulsdon, Surrey.
(Finsbury Technical College, London.)
- 1921 Evans, Arthur Jack Sackville, 185, Maida Vale, London, W. 9.
(The University of Cambridge.)
- 1920 Evans, Harold Arthur, 47, Victoria Road, Woolston, Hants.
(University College, Southampton.)

- 1917 Evans, Norman Leslie, 19, Durham Road, Sparkhill, Birmingham.
(H. L. Heathcote, M.Sc., F.I.C.)
- 1920 Evans, Urien Cori, 28, Munceaster Road, London, S.W. 11.
(Finsbury Technical College, London.)
- 1921 Evans, Vivian Richard, 14, St. John's Road, Maindee, Newport, Mon.
(Head of the Chemistry Department, Newport Technical College.)
- 1920 Everett, John Garwood, 151, Praed Street, Paddington, London, W. 2.
(School of the Pharmaceutical Society.)
- 1918 Ewing, Miss Margaret Anderson, M.A. (Aberd.), 5, Church Street, Huntly,
Aberdeenshire.
(Royal Technical College, Glasgow.)
- 1921 Exell, Harold Cyril, 41, Cautley Avenue, Clapham Common, London,
S.W. 4.
(King's College, London.)

F

- 1921 Fairclough, Fred, 20, Gordon Avenue, Bolton, Lanes.
(Ernest Marsden, F.I.C.)
- 1920 Fairgrieve, Miss Jessie Helen Carroll Dick, North Middleton, Gorebridge,
Midlothian, Scotland.
(Heriot-Watt College, Edinburgh.)
- 1921 Fairley, Henry, 6, Faraday Place, Addiewell, Midlothian, Scotland.
(The University of Edinburgh.)
- 1919 Falconer, William Alexander, c/o Mrs. Walker, 125, North John Street,
Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Farina, Philip Edward Lodovico, 8, Bettridge Road, Hurlingham,
London, S.W. 6.
(E. V. Evans, O.B.E., F.I.C.)
- 1921 Farrell, Alfred Edmond, M.A., B.Sc. (Edin.), 37, Bellevue Road,
Edinburgh.
(The University of Edinburgh.)
- 1916 Farrer, William John Gladstone, 1, Princes Parade, Church End,
Finchley, London, N. 3.
(Finsbury Technical College, London.)
- 1919 Farrer, William Lynch Hurbow, Fern Leigh, Wakefield Road, Tanshelf,
Pontefract, Yorks.
(C. P. Finn, B.Sc., F.I.C.)
- 1917 Ferguson, John, 15, Dean Crescent, Stirling, Scotland.
(Royal Technical College, Glasgow.)
- 1916 Ferrier, George Straton, 10, Hamilton Park Terrace, Hillhead,
Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Fielder, Cecil John, 30, Avenue Road, St. John's Wood, London,
N.W. 8.
(Royal College of Science, London.)

- 1919 Fisher, Alfred, 50, Exeter Road, Nottingham.
(University College, Nottingham.)
- 1918 Fisher, H. Elias, 4, Havering Street, London, E. 1.
(Finsbury Technical College, London.)
- 1919 Fitter, Raymond John, 23, Woodward Road, East Dulwich, London,
S.E. 22.
(University College, London.)
- 1921 Fleming, James Sinton Bruce, 47, Montpelier Park, Edinburgh.
(The University of Edinburgh.)
- 1921 Flett, Thomas, Anchor Cottage, Kirkwall, Orkney.
(The University of Glasgow.)
- 1915 Forrester, Charles, 4, Barclay Terrace, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1921 Forster, Claudius, 239, Westmorland Road, Newcastle-on-Tyne.
(Armstrong College, Newcastle-on-Tyne.)
- 1919 Foster, Frank, Station Road, Brockholes, Huddersfield.
(L. G. Paul, Ph.D., F.I.C.)
- 1919 Fox, Miss Margaret Lucy, 5, Strafford Road, Twickenham, Middlesex.
(E. Grant Hooper, F.I.C.)
- 1920 Frankenburg, William Eric, 78, Goldhurst Terrace, Hampstead, London,
N.W. 6.
(Imperial College of Science and Technology.)
- 1920 Franklin, Reginald George, 28, Parkhurst Road, Holloway, London, N. 7.
(King's College, London.)
- 1920 Fraser, Bertram Turner, 25, Restalrig Terrace, Leith.
(Heriot-Watt College, Edinburgh.)
- 1910 Fraser, Frank Jardine, 12, Nicander Road, Sefton Park, Liverpool.
(E. W. Lucas, C.B.E., F.I.C.)
- 1920 Fraser, James Everard, 5, Stanley Street, Portobello, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1920 Freeman, Percy Arthur Reginald, 114, Laburnum Grove, North End,
Portsmouth.
(Frank Wade, A.R.C.S., F.I.C.)
- 1920 French, Herbert, 9, Shandon Place, North Merchiston, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1920 Fritz, Jack, 5, Rugby Mount, Meanwood Road, Leeds.
(Central Technical School, Leeds.)
- 1920 Frodsham, James Norman, Westerfield, Pensby Road, Heswall,
Cheshire.
(John Hanley, F.I.C.)
- 1921 Fry, Victor Eric, 1, Westminster Gardens, Hillhead, Glasgow.
(Royal Technical College, London.)
- 1918 Fuller, Charles Hubert Francis, 132, Rann Street, Ladywood, Birmingham.
(Finsbury Technical College, London.)
- 1921 Fulton, James Davidson, 63, King's Road, Beith, Ayrshire.
(The University of Glasgow.)

G

- 1921 Galinski, Myer, The Homestead, 135, The Common, Clapton, London, E. 5.
(Finsbury Technical College, London.)
- 1920 Gallaher, James, Inglenook, Friern Lane, Whetstone, London, N. 20.
(Sir John Cass Technical Institute, London.)
- 1915 Galletly, Charles Harvey, 960, Sauchiehall Street, Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Gallie, George, County Buildings, Haddington, Scotland.
(Heriot-Watt College, Edinburgh.)
- 1920 Garrad, Harold James, 102, Nortoft Road, Bournemouth.
(University College, Southampton.)
- 1920 Garrie, David Nicol, 3, Tullibody Road, Alloa, Scotland.
(Royal Technical College, Glasgow.)
- * 1918 Gates, Stanley Frederick, 12, Albion Square, London, E. 8.
(The University of Oxford.)
- 1919 Geary, William, 7, East Park Avenue, Hull.
(G. E. Johnson, B.Sc., F.I.C.)
- 1920 George, Cyril Henry, 9, Hanover Street, Rye Lane, London, S.E. 15.
(T. T. Cocking, F.I.C.)
- 1921 Gheik, Nand Lall, c/o Messrs. Grindlay & Co., 54, Parliament Street, London, S.W. 1.
(University College, Aberystwyth.)
- 1921 Gibbon, Eric Rupert, Spring Bank, Whitefield Road, Ashton-on-Mersey, near Manchester.
(The University of Manchester.)
- 1919 Giles, John Kenneth, Hillcrest, Arkley Barnet, Herts.
(King's College, London.)
- 1920 Glen, William, Woodleigh, Murray Street, Paisley.
(Royal Technical College, Glasgow.)
- 1920 Godby, William Alfred, 77, Blondel Street, Battersea, London, S.W. 11.
(G. W. Monier-Williams, O.B.E., M.C., F.I.C.)
- 1916 Gold, Arthur Kempton, 1a, Lysia Street, Fulham, London, S.W. 6.
(G. W. James, M.A., F.I.C.)
- 1919 Golding, William Ernest, 167, Monega Road, Forest Gate, London, E. 7.
(F. M. Potter, M.B.E., B.Sc., F.I.C.)
- 1921 Goldsmith, Eric Waller, Woolsthorpe Rectory, Grantham, Lines.
(University College, Nottingham.)
- 1920 Goldstein, Jacob, 39, Montague Street, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1921 Goldthorpe, Harold Hopwood, Shelley, near Huddersfield, York.
(Technical College, Huddersfield.)
- 1920 Goodale, Arthur Albert, 45, Beetive Road, Putney, London, S.W. 15.
(C. E. Sage, F.I.C.)
- 1917 Goodall, George Forrest, 22, Hartington Road, Chorlton-cum-Hardy, Manchester.
(Royal Technical College, Glasgow.)

- 1920 Goodman, Lewis, Hilleston, Cleanthus Road, Shooters Hill, London, S.E. 18.
(South-Western Polytechnic, London.)
- 1921 Goodwin, George Harry, Kingsfield Oval, Basfield, Stoke-on-Trent.
(Head of the Chemical Department, Central School of Science and Technology, Stoke on-Trent.)
- 1921 Goss, Frank Robert, 4, Abbotsford Road, Goodmayes, Ilford, Essex.
(Imperial College of Science and Technology, London.)
- 1919 Graham, Gilbert, 7, Campsie Terrace, Thornliebank, near Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Grant, James, 25, Dundas Street, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1919 Grant, William Thomas, c/o Messrs. H. N. McArthur & Co., Ltd., Bull Lane, Aintree, Liverpool.
(William Bacon, B.Sc., F.I.C.)
- 1919 Gray, Kenneth Washington, Bencleugh, Harpenden, Herts.
(The University of Cambridge.)
- 1921 Grayson, Harold John, 60, Broadwater Road, Tottenham, London N. 17.
(University College, London.)
- 1921 Green, Frank Joseph, 36, Botha Road, Plaistow, London, E. 13.
(T. T. Cocking, F.I.C.)
- 1917 Greenfield, Geoffrey James, West Street, Storrington, Pulborough, Sussex.
(Imperial College of Science and Technology, London.)
- 1917 Greenwood, Miss Gladys May, B.Sc. (Lond.), 68, Devonshire Road, Blackpool, Lancs.
(King's College, London.)
- 1921 Greenwood, John, 38, Gordon Street, Abbey Hey, Gorton, Manchester.
(W. D. Rogers, B.Sc., A.R.C.S., F.I.C.)
- 1920 Gregory, Louis Wilfred, 273, Woodborough Road, Nottingham.
(University College, Nottingham.)
- 1921 Griffiths, Albert Edward, 25, Meadowbank Crescent, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1908 Griffiths, Hugh, B.Sc., A.R.C.S. (Lond.), 15, New Bridge Street, London, E.C. 4.
(Imperial College of Science and Technology, London.)
- 1921 Griffiths, Wilfred Stoughton, 43, Hengist Road, Erith, Kent.
(King's College, London.)
- 1920 Griggs, Edward Walter, 141, Capel Road, Forest Gate, London, E. 7.
(F. M. Potter, M.B.E., B.Sc., F.I.C.)
- 1921 Grimwood, Robert Charles, 14a, Graham Road, Dalston, London, E. 8.
(Finsbury Technical College, London.)
- 1920 Groves, Adam Traill, 12, James Place, Leith.
(Heriot-Watt College, Edinburgh.)
- 1920 Grundy, James Gibson, 4, Henry Street, Bolton, Lancs.
(Royal Technical Institute, Salford.)

- 1921 Guinan, John Francis, 6, Lothair Street, Chorlton-on-Medlock, Manchester.
(Royal Technical College, Salford.)

H

- 1919 Hall, George Frederick, Olgra House, Moore Road, Mapperley, Nottingham.
(University College, Nottingham.)
- 1921 Hall, John Graham, 96, Kedleston Road, Derby.
(University College, Nottingham.)
- 1920 Halliwell, Tom, Eaglehurst, Bracken Road, East, Brighouse, Yorks.
(Technical College, Huddersfield.)
- 1920 Hallum, William, 75, Mill Street, Rutherglen, Lanarkshire.
(The University of Glasgow.)
- 1920 Halton, Philip, 72, Elmhurst Road, Reading.
(University College, Reading.)
- 1921 Handley, Percy, Loughborough College, Loughborough, Leicester.
(Arthur Bramley, D.Sc., A.R.C.S., F.I.C.)
- 1920 Handley, Philip George, 133, Park Lane, Stoke Newington, London, N. 16.
(Finsbury Technical College, London.)
- 1919 Hansford, Mitchell Harold, 68, Brantfell Road, Blackburn.
(Municipal Technical School, Blackburn.)
- 1920 Hare, Andrew Thomas Stewart, Port Seton House, Cockenzie, East Lothian.
(Heriot-Watt College, Edinburgh.)
- 1920 Harper, Hugh, 7, Meadowbank Terrace, Edinburgh.)
(Heriot-Watt College, Edinburgh.)
- 1921 Harris, John Sargent, 20, Essex Road, Rushden, Northants.
(The University of Cambridge.)
- 1920 Harrison, Alan Cobden, Park Lodge, Park View, Southall, Middlesex.
(Royal School of Mines, London.)
- 1919 Harrison, Douglas Creese, 18, Church Crescent, Muswell Hill, London, N. 10.
(King's College, London.)
- 1920 Harrold, Wilfred George, University College Hall, Ealing, London, W. 5.
(University College, London.)
- 1920 Harrow, Andrew Nicoll, 86, Alva Street, Kirkealdy, Fife.
(Heriot-Watt College, Edinburgh.)
- 1921 Hart, Edward Holford, 35, Park Avenue, Cricklewood, London, N.W. 2.
(Imperial College of Science and Technology, London.)
- 1921 Hart, Joel Edward, 249, Commercial Road, London, E. 1.
(East London College, London.)
- 1920 Hart, Leslie Ralph, Beaulieu, St. Albans, Herts.
(King's College, London.)
- 1920 Hartfall, Stanley Jack, 13, Springfield Mount, Leeds.
(Central Technical School, Leeds.)

- 1920 Harvey, Cecil Owen, 5, Park Hill Road, Chingford, London, E. 4.
(Imperial College of Science and Technology, London.)
- 1921 Harvey, Sidney John, Bridge Cottage, Leatherhead, Surrey.
(Battersea Polytechnic, London.)
- 1911 Hatch, Frank Akerman, Rivulet House, Gentleman's Row, Enfield.
(Finsbury Technical College, London.)
- 1920 Hatfield, John Smith, 30, St. George's Court, Gloucester Road, London,
S.W. 7.
(Imperial College of Science and Technology, London.)
- 1920 Hawley, James, Montague House, 67, Millhill, Musselburgh.
(The University of Birmingham.)
- 1920 Haworth, Thomas, 10, Frederick Street, Oswaldtwistle, Lanes.
(Municipal Technical School, Blackburn.)
- 1920 Hayes, Sydney Richard, Rutland, 19, Woodbrooke Road, Bournville,
Birmingham.
(N. P. Pooth, F.I.C.)
- 1919 Hayhurst, Horace, 57, Grasmere Place, Whitton, Blackburn.
(Municipal Technical School, Blackburn.)
- 1921 Heather, Jack Rowan, 85, Lakeside Road, Palmers Green, London, N. 13.
(T. Macara, F.I.C.)
- 1921 Hecker, William Rundle, Woodlands, Station Road, New Barnet, Herts.
(King's College, London.)
- 1916 Hedgecock, Stuart William, 67, Braxted Park, Streatham, London,
S.W. 16.
(King's College, London.)
- 1916 Hemmings, William George, Kingsley, Friern Lane, New Southgate,
London, N.
(Finsbury Technical College, London.)
- 1921 Hendy, Reginald William, 45, Orchard Place, Blackwall, London, E. 14.
(Sir John Cass Technical Institute, London.)
- 1920 Heppell, Walter, 77, Central Avenue, New Basford, Nottingham.
(University College, Nottingham.)
- 1921 Herd, Clifford Walter, 12a, St. Andrew's Terrace, Crabble Avenue,
Dover.
(D. W. Kent-Jones, B.Sc., F.I.C.)
- 1918 Heslop, Henry Middleton, Itfley, Tregolls Road, Truro, Cornwall.
(University College, Cardiff.)
- 1920 Hewis, Harold Wilton, 819, Hucknall Road, Nottingham.
(University College, Nottingham.)
- 1920 Hickman, Alan, c/o Messrs. G. Skey & Co., Ltd., Tamworth, Staffs.
(Municipal Technical School, Birmingham.)
- 1920 Hickman, George, 83, Gladstone Road, Sparkbrook, Birmingham
(The University, Birmingham.)
- 1920 Hicks, Robert Haxwell, 65, Romilly Road, Canton, Cardiff.
(University College, Cardiff.)
- 1919 Higgins, John Stuart Reginald, The Brae, Glasgow Road, Perth.
(R. M. Clark, B.Sc., F.I.C.)

- 1919 Hill, Joseph, 58, Spring Street, Accerington, Lanes.
(Municipal Technical School, Blackburn.)
- 1919 Himmat, Mahmoud Ahmed, Government Analytical Laboratory, Cairo, Egypt.
(Alfred Lucas, O.B.E., F.I.C.)
- 1919 Hinchliffe, Frederick, 5, Richmond Avenue, Prestwich, Manchester.
(Royal Technical Institute, Salford.)
- 1919 Hindes, Frederic William, 1, Barlow Street, Oldham, Lanes.
(The University of Manchester.)
- 1921 Hindes, Miss Gwendolen, B.Sc.Pharm. (Manc.), 1, Barlow Street, Oldham, Lanes.
(The University, Manchester.)
- 1920 Hodgkiss, Frank Livesey, 274, Plodden Lane, Farnworth, near Bolton.
(Municipal Technical School, Blackburn.)
- 1915 Hoff, Ronald William, 14, West Street, Leominster.
(F. E. Thompson, A.R.C.S., F.I.C.)
- 1921 Hoffenberg, Isidore Ely, 20, Carlton Mount, Woodhouse Lane, Leeds.
(The University of Leeds.)
- 1915 Hoffman, Herbert, 6, Culmann Str., Zurich.
(King's College, London.)
- 1919 Holden, William Thomas, 22, Earnsdale Road, Darwen.
(Municipal Technical School, Blackburn.)
- 1921 Hole, Stanley Reginald, 10, Ringstead Road, Catford, London, S.E. 6.
(Imperial College of Science and Technology, London.)
- 1920 Holland, Hubert Ernest, Cumbria, Station Road, Hayes, Middlesex.
(Sir John Cass Technical Institute, London.)
- 1920 Holmes, Albert Baden, Killygordon, Mossfield Road, King's Heath, Birmingham.
(The University of Birmingham.)
- 1914 Holt, Hammersly David George, 24, Portland Place, London, W. 1.
(The University of Cambridge.)
- 1919 Hopkins, Sidney John, 23, Portland Street, Huddersfield.
(Finsbury Technical College, London.)
- 1918 Horn, Alfred Henry, 19, Lichfield Road, East Ham, London, E.
(East London College, London.)
- 1921 Horton, Harold Vivian, 9, Brambledown Road, Wallington, Surrey.
(University College, London.)
- 1917 Horton, Laurence, 45, Steade Road, Sheffield.
(John Evans, F.I.C.)
- 1910 Hough, Alexander Thomas, 188, Boulevard de Charonne, Paris, 20e.
(J. Gordon Parker, Ph.D., F.I.C.)
- 1920 Houghton, Arthur Sereld, 7, Lincoln Street, Chelsea, London, S.W. 3.
(South-Western Polytechnic, London.)
- 1920 Houlihan, John Ernest, 38, Park Road, Plumstead, London, S.E. 18.
(East London College, London.)
- 1920 House, Cecil John, 132, Hailsham Avenue, Streatham Hill, London, S.W. 2.
(Imperial College of Science and Technology, London.)

- 1917 Howard, Herbert Leslie, The Ferns, 14, South-Eastern Road, Ramsgate.
(Edmund White, B.Sc., F.I.C.)
- 1919 Howard, Thomas George, 7, Hazeldene Road, Goodmayes, Ilford,
Essex.
(C. O. Bannister, A.R.S.M., F.I.C.)
- 1920 Howes, Herbert Stanley, Belle Monte, Devizes, Wilts.
(The University of Bristol.)
- 1920 Huddart, Reginald.
(University College, London.)
- 1920 Hudson, Charles Arthur, 134, Sneinton Dale, Nottingham.
(University College, Nottingham.)
- 1920 Hudson, Henry Rowson, 17, Bloomsbury Square, London, W.C. 1.
(School of the Pharmaceutical Society.)
- 1919 Hugill, William, 5, Falmouth Road, Abbeydale, Sheffield.
(The University of Sheffield.)
- 1920 Hulme, Henry Cecil, 29, High Street, Kings Heath, Birmingham.
(Municipal Technical School, Birmingham.)
- 1913 Hulme, William, M.Sc. (Manc.), Brook House, London Road, Maccles-
field.
(The University of Manchester.)
- 1920 Hutchinson, Christopher West, Coombehurst, Winscombe, Somerset.
(N. P. Booth, F.I.C.)
- 1912 Hutcliffson, Archibald Moritz, B.Sc. (Lond.), 2, Edith Villas, Brantham,
near Manningtree.
(Oliver Trigger, M.B.E., F.I.C.)
- 1919 Hutton, John Stevenson, 44, Seafield Road, Dundee, Scotland.
(Thomas Jamieson, F.I.C.)
- 1919 Hutton, Robert, North Park, Thornliebank, near Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Hyland, John Laurence, 158, Mortlake Road, Ilford, Essex.
(Sir John Cass Technical Institute, London.)
- 1918 Hyslop, William McNinch, Damulin, 17, Craigie Road, Ayr.
(Royal Technical College, Glasgow.)

I

- 1920 Ibison, Austin, 79, Eastbourne Road, Birkdale, Lancs.
(John Hanley, F.I.C.)
- 1919 Illing, Edward Thomas, St. Andrew's House, Roupell Street, Lambeth,
London, S.E. 1.
(Cyril Dickinson, B.Sc., F.I.C.)
- 1919 Inglis, Alexander Stewart Robertson, 15, Waverley Park, Edinburgh.
(Heriot-Watt College, Edinburgh.)

J

- 1920 Jack, John Will, 79, Wroughton Road, Battersea, London, S.W. 11.
(Sir John Cass Technical Institute, London.)

- 1920 Jackman, Douglas Norman, 18, West Side, Clapham Common, London, S.W. 4.
(University College, London.)
- 1919 Jackson, John Arnold, 167, Westbourne Avenue, Great Lever, Bolton, Lanes.
(Harry Hurst, F.I.C.)
- 1920 Jahans, Gordon Alexander, 26, Hampton Park, Redland, Bristol.
(Merchant Venturers' Technical College, Bristol.)
- 1919 Jamieson, Archibald Robert, 30, Canal Street, Renfrew, Scotland.
(Royal Technical College, Glasgow.)
- 1920 Jamieson, Morris, 14, Deepark Gardens, Tollcross, Glasgow.
(Imperial College of Science and Technology, London.)
- 1919 Jarrett, Walter George, 15, Wenlock Road, Handsworth, Birmingham.
(Municipal Technical School, Birmingham.)
- 1919 Jarvis, Alfred James, 166, Grove Street, Liverpool.
(The University of Liverpool.)
- 1920 Jeffrey, John George Alexander, 14, Cumberland Street, Edinburgh.
(The University of Edinburgh.)
- 1919 Jenkins, Samuel Harry, 138, Bury New Road, Broughton, Manchester.
(Harold Stevenson, F.I.C.)
- 1920 Jenkinson, Thomas Alfred, 5, Glebe Street, Marsh, Huddersfield.
(Technical College, Huddersfield.)
- 1914 Jermain, William Morgan, B.Sc. (Wales), 10, Wordsworth Avenue, Cardiff.
(King's College, London.)
- 1921 Johnson, Bertrand Reaveley, The Hawthorns, Moss Lane, Pinner, Middlesex.
(Finsbury Technical College, London.)
- 1920 Johnson, Edgar Bertie, 32, Alcester Road, Moseley, Birmingham.
(The University, Birmingham.)
- 1918 Johnson, Ernest Norman, 167, Belle Vue Road, Leeds.
(B. A. Burrell, F.I.C.)
- 1920 Johnson, Rowland Nicholas, Greenstede, West Hill, East Grinstead, Sussex.
(King's College, London.)
- 1920 Johnston, George, 80, Balgreen Road, Murrayfield, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1920 Johnston, James, junr., 80, Balgreen Road, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1908 Johnston, Thomas Nicholl, B.Sc. (Q.U.I.), Seaview House, Carnlough, Co. Antrim.
(Queen's University, Belfast.)
- 1918 Jones, David Llewelyn, B.Sc. (Wales), 1, Marble Terrace, Llandyssul, S. Wales.
(University College, Aberystwyth.)
- 1921 Jones, Edgar, Milverton House, 167, Upper Dale Road, Derby.
(Joseph Yates, F.I.C.)
- 1921 Jones, John Mather, 24, St. Loys Road, Tottenham, London, N. 17.
(Norman Evers, B.Sc., F.I.C.)

- 1917 Jones, Leo Francis, St. Elmo, Caerleon, Mon.
(J. A. Hatfield, F.I.C.)
- 1919 Jones, Norman Ellathorne, 169, Wanstead Park Road, Ilford, Essex.
(Bernard Dyer, D.Sc., F.I.C.)
- 1918 Jones, Richard Arthur, 68, Highbury New Park, London, N. 5.
(Finsbury Technical College, London.)
- 1916 Jones, William Forster, 5, Forest Grove, Treforest, Glam.
(E. C. Evans, B.Sc., F.I.C.)
- 1919 Joseph, James Dillwyn, 7, Bainbridge Street, Rose Grove, Stockport
Road, Manchester.
(College of Technology, Manchester.)

K

- 1920 Kapur, Purushottam Das, c/o Messrs. Thomas Cook & Son, Ludgate
Circus, London, E.C. 4.
(Royal Technical College, Glasgow.)
- 1920 Kay, John Loudon, 39, Heugh Street, Falkirk, Scotland.
(Royal Technical College, Glasgow.)
- 1920 Kay, Leonard James, 42, Wilson Street, Poplar, London, E. 14.
(East London College, London.)
- 1920 Keenan, Henry Wilfrid, 3, Marchmont Court, Addison Gardens, West
Kensington, London, W. 14.
(Sir John Cass Technical Institute, London.)
- 1921 Kelly, Charles Ambrose, 26, Gloucester Road, Tuebrook, Liverpool.
(W. R. Hardwick, B.Sc., F.I.C.)
- 1918 Kelly, Herbert John, 148, Olive Road, Cricklewood, London, N.W. 2.
(East London College, London.)
- 1920 Kershaw, Fred Greenwood, 75, Cranbourne Road, Waterloo, Ashton-
under-Lyne, Lancs.
(W. D. Rogers, B.Sc., A.R.C.S., F.I.C.)
- 1919 Kipping, Norman Victor, Chalcots, 41, Roxborough Park, Harrow-on-
the-Hill.
(Birkbeck College, London.)
- 1920 Kirkwood, Edmund, British Dyestuffs Corporation (Huddersfield), Ltd.,
Dalton Works, Huddersfield.
(H. Webster Moss, A.R.C.Sc.I., F.I.C.)
- 1916 Kitson, Joe, Wallroyds, Denby Dale, Yorks.
(H. Webster Moss, A.R.C.Sc.I., F.I.C.)
- 1921 Klein, Ralph Harry, 11, Park Place Villas, Maida Vale, London, W. 2.
(Sir John Cass Technical Institute, London.)
- 1918 Knight, Harry Richard, 2, Roxley Road, Lewisham, London, S.E. 13.
(C. O. Bannister, A.R.S.M., F.I.C.)
- 1920 Knights, Edward Donovan, 197, Upper Dale Road, Derby.
(Leonard Archbutt, F.I.C.)
- 1918 Kotibhaskar, Moreshvar Ganesh, M.A., B.Sc. (Bombay), The College
of Technology, Manchester.
(College of Technology, Manchester.)

L

- 1920 Lacamp, Auguste Leonard Bernard, St. Louis, Marlborough Grove, York.
(Technical College, Huddersfield.)
- 1920 Laing, Alexander George, 30, Murrayfield Avenue, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1920 Laing, John Barclay, Railway Hotel, Haddington, Scotland.
(Heriot-Watt College, Edinburgh.)
- 1919 Laing, Thomas Edward, Haselmere, 26, Albion Grove, London, N. 1.
(South-Western Polytechnic, London.)
- 1920 Laing, William Mossman, 22, Eastfield, Joppa, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1920 Langsdale, Donald Abbott, 51, Sandon Street, New Basford, Nottingham.
(University College, Nottingham.)
- 1919 Lavery, David, 91, Coventry Drive, Dennistoun, Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Lee, William Joseph, 23, Well Close Terrace, Leeds.
(Central Technical School, Leeds.)
- 1921 Lees, John Ganley, 2, Rothwell Street, Dalton, Huddersfield.
(Technical College, Huddersfield.)
- 1919 Legg, Vernon Howes, B.Sc. (Sheff.), 95, Carter Knowle Road, Millhouses, Sheffield.
(The University of Sheffield.)
- 1919 Leitch, James Muil, 1, Ormonde Mount, Muirend, Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Lewis, Alkin, 74, Sutherland Avenue, Maida Vale, London, W. 9.
(King's College, London.)
- 1917 Lighton, Charles, 14, Loddiges Road, Hackney, London, E. 9.
(Finsbury Technical College, London.)
- 1920 Lindemann, Christel Ferdinand, Government Chemical Laboratories, P.O. Box 1080, Johannesburg, S. Africa.
(John McCrae, Ph.D., F.I.C.)
- 1921 Ling, Arthur William, 15, Howard Road, Penge, London, S.E. 20.
(M. J. R. Dunstan, O.B.E., M.A., F.I.C.)
- 1919 Linnell, Wilfred Herbert, 12, Highbury, Monkseaton, Whitley Bay, Northumberland.
(Armstrong College, Newcastle-on-Tyne.)
- 1920 Linstead, Reginald Patrick, 46, Compton Road, Winchmore Hill, London, N. 21.
(Finsbury Technical College, London.)
- 1919 Lipscomb, Alfred George James, San Kara, Osmaston Park Road, Derby.
(Joseph Yates, M.Sc., F.I.C.)
- 1920 Litchfield, Arthur Frank Darwin, 10, Knyveton Road, Bournemouth.
(J. Gordon Hay, F.I.C.)
- 1921 Llewellyn, Herbert Mervyn, 35, Northfield, Bridgwater, Somerset.
(University College, Aberystwyth.)

- 1920 Lochhead, George Robb, 2, Glenview, Paisley, Scotland.
(Royal Technical College, Glasgow.)
- 1920 Lock, Ritchie Hart, The Artists' Rifles Headquarters, Dukes Road,
Euston Road, London, W.C. 1.
(University College, London.)
- 1920 Lohn, Clarence Edward, 79, Clova Road, Forest Gate, London, E. 7.
(Finsbury Technical College, London.)
- 1920 Lomax, James, 25, Devonshire Road, Eccles, Lancs.
(F. Scholefield, M.Sc., F.I.C.)
- 1920 Long, Herbert Kildare, 2, Chiltern Manor, Wargrave, Berks.
(Imperial College of Science and Technology, London.)
- 1920 Loudon, Charles Robertson, 4, South View, Dalmuir, Dumbartonshire.
(The University of Glasgow.)
- 1920 Love, Malcolm McFarlane, 28, Caledonia Street, Paisley, Scotland.
(T. A. Wilson, F.I.C.)
- 1920 Lovett, Thomas Whittaker, 32, Oak Road, Lower Broughton, Man-
chester.
(S. E. Melling, F.I.C.)
- 1919 Lucke, Douglas Thurlow, Gemcote, Cliffsea Grove, Leigh-on-Sea,
Essex.
(Leo Taylor, F.I.C.)
- 1921 Lumsden, Miss Doris Seton Adamson, 142, Braid Road, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1920 Lynch, Robert Edward, 129, Mersey Road, Widnes, Lancs.
(W. D. Rogers, B.Sc., A.R.C.S., F.I.C.)

M

- 1911 MacDonald, Charles Stuart, 8, Clarence Road, Southsea, Hants.
(A. Philip, B.Sc., A.R.S.M., F.I.C.)
- 1920 Mackley, Fred.
(T. F. Harvey, F.I.C.)
- 1919 Macleod, Hector Alexander, Finlay Drive, Dennistoun, Glasgow.
(Royal Technical College, Glasgow.)
- 1916 Macqueen, John Melven, B.Sc. (Lond.), Bryngwyn, 88, Muswell Road,
Muswell Hill, London, N. 10.
- 1920 Madden, Frank Cox, 8, Merton High Street, Wimbledon, London,
S.W. 19.
(J. J. Fox, O.B.E., D.Sc., F.I.C.)
- 1920 Mair, John Alexander, B.Sc. (Glas.), 53, Holmhead Street, Glasgow.
(The University of Glasgow.)
- 1919 Malthy, John Gwilliam, 29, Winchelsea Avenue, Newark.
(University College, Nottingham.)
- 1918 Maplethorpe, Cyril Wheatley, 16, Chesnut Avenue, Queens Road, Hull.
(The late E. F. Harrison, C.M.G., B.Sc., F.I.C.)
- 1920 Marson, Cecil Brittain, 1, Hinderwell Street, Hull.
(W. B. Parker, F.I.C.)

- 1919 Martin, George Frank, 85, Church Hill, Walthamstow, London, E. 17.
(Imperial College of Science and Technology, London.)
- 1920 Mascull, George Joseph, 42, Vestris Road, Forest Hill, London, S.E. 23.
(King's College, London.)
- 1919 Mason, Denis Clifford, The Firs, Bromsgrove, Worcestershire.
(A. E. Tucker, F.I.C.)
- 1920 Massie, Duncan McRobert, 14, Rock Street, Higher Broughton, Manchester.
(College of Technology, Manchester.)
- 1919 Mathias, Owen, 31, Clarendon Road, Whalley Range, Manchester.
(W. D. Rogers, B.Sc., A.R.C.S., F.I.C.)
- 1921 Mathie, John Richardson, Roseneath, 14, Eglinton Place, Saltcoats, Ayrshire.
(William Rintoul, O.B.E., F.I.C.)
- 1920 Matthews, Geoffrey Charles, 31, Stapenhill Road, Burton-on-Trent.
(C. G. Matthews, F.I.C.)
- 1917 Matthews, Norman Louis, 45, Tyrwhitt Road, Brockley, London, S.E. 4.
(Finsbury Technical College, London.)
- 1920 Matthews, Robert Karran, 24, Grasville Road, Higher Tranmere, Birkenhead, Cheshire.
(H. J. Evans, B.Sc., F.I.C.)
- 1921 Matthews, Samuel, 46, Glenroy Street, Cardiff.
(H. W. Webb, M.Sc., F.I.C.)
- 1920 Mattingley, Fred, 4, Carn Brea, Bath Road, Margate.
(A. S. Carlos, B.Sc., F.I.C.)
- 1920 McCarter, Geoffrey Lailey, 34, Milford Road, Great Lever, Bolton, Lanes.
(J. R. Appleyard, F.I.C.)
- 1920 McCartney, William, 5, Mortonhall Road, Edinburgh, Scotland.
(Heriot-Watt College, Edinburgh.)
- 1921 McCurdie, Thomas, 20, Torrens Square, Romford Road, London, E. 15.
(T. Cockburn, F.I.C.)
- 1920 McDonald, Alexander, junr., 1399, Argyle Street, Glasgow.
(Royal Technical College, Glasgow.)
- 1921 McDonald, Hector Archibald, Cultbent, Linlithgow.
(The University of Edinburgh.)
- 1921 McDougall, Alan Cameron, Iona Villa, Hunter's Quay, Argyleshire.
(Royal Technical College, Glasgow.)
- 1920 McGeorge, Walter, 707, Govan Road, Glasgow.
(Royal Technical College, Glasgow.)
- 1920 McGregor, Ernest, 4, West Savile Terrace, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1919 McGregor, James Hutchison, Cedar Cottage, Middleton Street, Alexandria, Scotland.
(Royal Technical College, Glasgow.)
- 1920 McGregor, Percy, 4, West Savile Terrace, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1903 McKee, Gilbert Stuart, Millbank Cottage, Frodsham, Cheshire.
(University College, Nottingham.)

- 1920 McKenzie, William, Mayfield, Dalratho Road, Grangemouth.
(Royal Technical College, Glasgow.)
- 1920 McKie, Douglas, 212, Well Hall Road, Eltham, London, S.E. 9.
(University College, London.)
- 1921 McMillan, Walter Keith, Ashley, Market Harborough, Northants.
(King's College, London.)
- 1920 Meacock, Harold Robert, 103, St. Leonard's Road, Northampton.
(Imperial College of Science and Technology, London.)
- 1920 Melhuish, Barradale Whiddon, 137, Sloane Street, London, S.W. 1.
(School of the Pharmaceutical Society.)
- 1920 Merrylees, James Simpson, 167, Glasgow Street, Ardrossan, Ayrshire.
(Royal Technical College, Glasgow.)
- 1920 Meston, Frederick William Henry, 42, Cowan Road, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1919 Middleton, Charles Craib, 35, Randolph Road, Stirling, Scotland.
(Royal Technical College, Glasgow.)
- 1920 Mieras, Adrian Pieter, 28, Beaverhall Road, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1919 Milford, Harry, 30, Teviotdale Place, Glenogle Road, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1920 Millar, William Harry, 606, Alexandra Parade, Glasgow
(The University of Glasgow.)
- 1914 Miller, Cecil James, 4, Victoria Road, Brighton, Sussex.
(R. A. Cripps, F.I.C.)
- 1921 Miller, Herbert Frederic, Cheviot, Village Way, Neasden, London, N.W. 10.
(Birkbeck College, London.)
- 1921 Milne, Leslie Burt, 27, Warren Road, Wanstead, London, E. 11.
(South-Western Polytechnic, London.)
- 1920 Mitchell, Michael George, A.R.C.Sc.I., Chemical Department, The Condensed Milk Company of Ireland, Ltd., Lansdowne, Limerick.
(Royal College of Science, Dublin.)
- 1921 Mitchell, Robert Edward, 41, Park Parade, Harlesden, London, N.W. 10.
(South-Western Polytechnic, London.)
- 1920 Mitchell, Thomas Corlett, Templehall Buildings, 168, Quarry Street, Hamilton, Scotland.
(Royal Technical College, Glasgow.)
- 1920 Moir, Hugh C., 7, Craigrelen Street, Dennistoun, Glasgow.
(The University of Glasgow.)
- 1920 Moncrieff, William, 15, Restalrig Terrace, Leith.
(Heriot-Watt College, Edinburgh.)
- 1920 Money, Charles Percy, 17, Gayton Road, London, N.W. 3.
(King's College, London.)
- 1919 Montfort, Edward, 282, Mitcham Road, Tooting, London, S.W. 17.
(Battersea Polytechnic, London.)
- 1920 Moore, Quintin, junr., Loirette, Wedderlea Drive, Cardonald, Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Morgan, Frank Ewen, 6, Pavilion Parade, Brighton.
(Imperial College of Science and Technology, London.)

- 1919 Morris, Fred, 73, Calvert Road, Bolton, Lanes.
(Harry Hurst, B.Sc., F.I.C.)
- 1921 Mort, Albert Victor, Frondeg, Mynyddbach, Landore, Swansea.
(H. J. Williams, F.I.C.)
- 1917 Moscow, Joseph, 14, Abinger Road, Bedford Park, London, W. 4.
(East London College, London.)
- 1919 Moses, Benjamin, B.Sc. (Liv.), 37, Lytton Avenue, Cheetham, Manchester.
(College of Technology, Manchester.)
- 1920 Mosley, Martin Aaron, 3, Rylands Road, Beeston, Notts.
(University College, Nottingham.)
- 1919 Mottram, Edward Neville, 49, Wellington Road, Eccles, Lanes.
(The University of Manchester.)
- 1919 Mountford, Harry, 2, Highfield Road, West Bridgford, Notts.
(University College, Nottingham.)
- 1921 Moyes, Robert Baird, 24, Caledonian Road, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1917 Muddiman, Ernest Walter, 52, Tanfield Road, Birkby, Huddersfield, Yorks.
(Technical College, Huddersfield.)
- 1920 Mumford, Stanley Augustus, Runnymede, 11, Wellington Road, Enfield, Middlesex.
(University College, London.)
- 1919 Munro, Reginald James, Bankier Villa, Banknock, Bonnybridge, Scotland.
(Royal Technical College, Glasgow.)
- 1921 Murch, William Owen, 25, Wix's Lane, Clapham Common, London, S.W. 4.
(Sir John Cass Technical Institute, London.)
- 1920 Murchison, Norman, 46, Brunswick Street, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1918 Murdoch, Donald George, 26, Olive Road, Cricklewood, London, N.W. 2.
(Finsbury Technical College, London.)
- 1917 Murphy, Edward Arthur, 82, Edwards Road, Erdington, Birmingham.
(Municipal Technical School, Birmingham.)
- 1920 Murray, Alexander Frederick, 3, Barns Park, Ayr, Scotland.
(Royal Technical College, Glasgow.)
- 1921 Myer, Edward, 51, Oxford Street, Liverpool.
(John Hanley, F.I.C.)
- 1919 Myers, Charles Frederick, The Gables, Mount, Outlane, Huddersfield.
(Technical College, Huddersfield.)

N

- 1921 Nattrass, Ernest Frederick, 58, Castlewood Road, Stamford Hill, London, N.
(East London College, London.)
- 1919 Naylor, Henry, 26, Palatine Road, Blackburn.
(Municipal Technical School, Blackburn.)

- 1921 Neave, Edward William James, Burnley, Tilford Road, Farnham, Surrey.
(King's College, London.)
- 1919 Neill, William Robertson, 60, Ardrossan Road, Saltcoats, Ayrshire.
(Royal Technical College, Glasgow.)
- 1912 Nelson, William Robert Francis, 6, Priory Pavement, Hornsey, London, N. 8.
(Finsbury Technical College, London.)
- 1920 Newbound, Reginald, Ivy Villa, Chatham Street, Newark-on-Trent.
(W. B. Parker, F.I.C.)
- 1917 Newby, Cecil Frank John, 21, Basils Road, Stevenage, Herts.
(S. Judd Lewis, D.Sc., F.I.C.)
- 1919 Newby, Edward John, 6, Shaw Road, Berkeley Avenue, Reading.
(University College, Reading.)
- 1919 Newton, Leonard Owen, 29, St. Mildred's Road, Lee, London, S.E. 12.
(J. H. Paul, B.Sc., F.I.C.)
- 1921 Nicholson, Lawrence Reginald, 4, Dungarvan Avenue, Putney, London, S.W. 15.
(C. S. Grace, B.Sc., F.I.C.)
- 1920 Nielsen, Edgar Axel, 16, Beechfield Street, Cheetham, Manchester.
(W. D. Rogers, B.Sc., A.R.C.S., F.I.C.)
- 1920 Nisbet, Hugh Bryan, 3, Maurice Place, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1918 Norman, Henry Robert Borchardt, 26, Howitt Road, Belsize Park, Hampstead, London, N.W. 3.
(King's College, London.)
- 1920 Norris, Woodford Stanley Gowan Plucknette, Bedford House, 42, Linton Road, Barking, Essex.
(Imperial College of Science and Technology, London.)
- 1921 North, Charles William, Leacroft, Stanwell Road, Ashford, Middlesex.
(King's College, London.)

O

- 1917 Ogilvie, Cyril Barker, Airlie, Sollershott W., Letchworth, Herts.
(Finsbury Technical College, London.)
- 1920 Oliver, Miss Jane Wilson, 6, Park Road, Leith.
(Heriot-Watt College, Edinburgh.)
- 1921 Orr, Andrew Picken, 22, Portland Road, Kilmarnock, Ayrshire.
(The University of Glasgow.)
- 1921 Osborne, Frederick William Seguin, St. Anthony, Vivian Avenue, Hendon, London, N.W. 4.
(Finsbury Technical College, London.)
- 1921 Overin, Richard Leslie, 15, Rose Hill Street, Derby.
(Leonard Archbutt, F.I.C.)
- 1921 Owen, Edward John, Porthdafarch Farm, Holyhead.
(University College, Bangor.)

P

- 1918 Page, Arthur Reginald, 63, Walford Road, Sparkbrook, Birmingham.
(F. C. A. H. Lantsberry, M.Sc., F.I.C.)
- 1919 Pagella, Eugene, The Poplars, No. 2, 173, Upper Priory Road, St. Denys,
Southampton.
(University College, Southampton.)
- 1919 Painton, William George, 17, Marlborough Road, Gunnersbury, London,
W. 4.
(South-Western Polytechnic, London.)
- 1921 Palfreeman, Geoffrey, Pleasley, Mansfield, Notts.
(University College, Nottingham.)
- 1921 Palmer, Herbert John, 41, Newcastle Street, Cubitt Town, Poplar,
London, E. 14.
(Sir John Cass Technical Institute, London.)
- 1920 Palmer, Neil, The Grasshopper, Westerham, Kent.
(Finsbury Technical College, London.)
- 1921 Parker, William Henry, 42, Mill Lane, Kidderminster.
(The University of Birmingham.)
- 1915 Parkes, Hubert Alfred, 56, Laurence Lane, Old Hill, Staffs.
(A. E. Parkes, F.I.C.)
- 1921 Parkinson, Reginald Henry, 14, Canton Street, Poplar, London, E. 14.
(Finsbury Technical College, London.)
- 1920 Parry, Brian Berey, 20, Etnam Street, Leominster.
(The University of Cambridge.)
- 1920 Parsons, Ian Herbert, 54, Queen Anne Street, London, W. 1.
(Imperial College of Science and Technology, London.)
- 1919 Patterson, William Stewart, 14, Moor Land Road, Leeds.
(H. B. Weeks, F.I.C.)
- 1921 Payne, John William, Nazeing Park Gardens, Waltham Cross, Essex.
(Finsbury Technical College, London.)
- 1920 Pearce, Cecil Charles, Sunny Croft, Wotton-under-Edge, Glos.
(Merchant Venturers' Technical College, Bristol.)
- 1920 Peard, George Thomas, Heyes House, Rainhill, Lanes.
(The University of Liverpool.)
- 1921 Pearson, Edward Feakes, Stapenhill, 32, Iona Road, Glasnevin, Dublin.
(Royal College of Science for Ireland.)
- 1920 Pearson, Miss Margaret, 16, Clanricarde Gardens, Notting_Hill Gate,
London, W.
(South-Western Polytechnic, London.)
- 1919 Perren, Edward Arthur, B.Sc., A.R.C.S. (Lond.), 70, Denton Road,
Hornsey, London, N. 8.
(Imperial College of Science and Technology, London.)
- 1920 Philip, George Gilmour, 199, High Street, Portobello, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1919 Phillips, Archibald John, Briar Cottage, Stanwell Moor, near Staines.
(Birkbeck College, London.)

- 1920 Phillips, Cyril Henry John Vezey, 190, Algernon Road, Lewisham, London, S.E. 13.
(East London College, London.)
- 1920 Phillips, Lewis Henry, M.C., 2, Adys Lawn, London, N.W. 2.
(Imperial College of Science and Technology, London.)
- 1915 Phillips, Reginald John, 8, Milford Road, Harborne, Birmingham.
(Arthur W. Knapp, B.Sc., F.I.C.)
- 1920 Philp, James Leith, 4, Victoria Gardens, Kirkealdy, Fife.
(Heriot-Watt College, Edinburgh.)
- 1921 Pickerill, Robert, 59, Derby Road, Nottingham.
(University College, Nottingham.)
- 1921 Pickup, Bernard Waudby, 42, Sefton Terrace, Beeston Hill, Leeds.
(Central Technical School, Leeds.)
- 1921 Pike, Richard Edwin, 12, Artillery Buildings, Greycoat Place, Westminster, London, S.W. 1.
(Sir John Cass Technical Institute, London.)
- 1919 Pink, Herbert Sheppard, The Limes, Newark-on-Trent.
(University College, Nottingham.)
- 1919 Pollard, Robert, 34, Albion Road, New Mills, Stockport.
(A. D. Heywood, F.I.C.)
- 1918 Porter, Charles Raymond, 21, St. Martin's Road, Canterbury.
(E. M. Hawkins, F.I.C.)
- 1920 Potter, Ernest Leslie, 28, Brookfield, West Hill, Highgate, London, N. 6.
(Sir John Cass Technical Institute, London.)
- 1921 Potter, Victor James, 34, Clifton Road, Kingston Hill, Surrey.
(Birkbeck College, London.)
- 1921 Pound, Albert, 81, Hoopern Street, Howell Road, Exeter.
(University College, Exeter.)
- 1919 Powers, Harold Edward Charles, 4, Grove Crescent, Woodford, London, E. 18.
(Birkbeck College, London.)
- 1921 Press, Edwin William Stanley, 156, Brigstock Road, Thornton Heath, Surrey.
(F. J. Lloyd, F.I.C.)
- 1919 Price, Charles Harold, 34, Empress Avenue, Woodford Green, Essex.
(Birkbeck College, London.)
- 1918 Price, Tom Brinley, 49, Stanwell Road, Penarth, near Cardiff.
(University College, Cardiff.)
- 1919 Prince, Alfred John, 49, Longbridge Road, New Barking, Essex.
(East London College, London.)
- 1917 Print, Harold Celestine, 69, Selsey Road, Edgbaston, Birmingham.
(The University of Birmingham.)
- 1920 Prowse, William Elliott, Ashfield, Kingsbridge, S. Devon.
(University College, London.)
- 1920 Pugh-Jones, Cecil Owen, 15, Colchester Avenue, Cardiff.
(University College, Cardiff.)
- 1919 Pulsford, Arthur Donald, 32, Loring Road, Isleworth, Middlesex.
(George Stubbs, C.B.E., F.I.C.)

- 1920 Purchase, William Henry George, 69, Honeybrook Road, Clapham Park, London, S.W. 12.
(Battersea Polytechnic, London.)
- 1921 Purdie, Desmond Tremeer, 34, Hillmarton Road, Holloway, London, N. 7.
(Northern Polytechnic Institute, London.)

Q

- 1921 Quick, William Clifford, 13, Brighton Road, Weston-super-Mare.
(The University of Bristol.)

R

- 1920 Radford, William Howard, Westwood, Shobnall, Burton-on-Trent.
(University College, London.)
- 1920 Randerson, William, 158, Wincheap, Canterbury.
(Imperial College of Science and Technology, London.)
- 1915 Rankin, John, Ravenslea, Bothwell, near Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Rattray, Edwin John Thomas, The Manse, West End Road, Haydock, St. Helens, Lancs.
(Royal Technical Institute, Salford.)
- 1919 Rawling, Tom, 24, Norwood Terrace, Victoria Road, Headingley, Leeds.
(Central Technical School, Leeds.)
- 1920 Ray, William John, 5, The Crescent, Boscombe, Hants.
(Imperial College of Science and Technology, London.)
- 1921 Read, Alfred Leonard, Tiptoe, Hordle, near Brockenhurst, Hants.
(University College, Southampton.)
- 1920 Read, Edwin Valentine, 1, Liberia Road, Highbury, London, N. 5.
(Finsbury Technical College, London.)
- 1921 Reay, Lionel Winson, 36, Nottingham Road, Derby.
(W. P. Skerchly, F.I.C.)
- 1921 Redsell, Edward Norman, 81, Clumber Street, Hull.
(G. E. Johnson, B.Sc., F.I.C.)
- 1919 Reece, William Henry, The Laboratory, Dunlop Rubber Co. (Far East), Ltd., Wakinhama, Kobe, Japan.
(D. F. Twiss, D.Sc., F.I.C.)
- 1919 Regnart, Horatio Clare, 33, Eskdale Terrace, Jesmond, Newcastle-on-Tyne.
(Armstrong College, Newcastle-on-Tyne.)
- 1921 Reid, John, St. Helens, Albert Terrace, Musselburgh, Scotland.
(South-Western Polytechnic, London.)
- 1920 Reid, John Wardlaw, 96, Howson Road, Brockley, London, S.E. 4.
(South-Western Polytechnic, London.)
- 1920 Renall, Herbert Frank, 17, Clifftown Road, Southend-on-Sea.
(University College, London.)

- 1920 Renton, Archibald, 2, Bonaly Road, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1920 Revis, Frank Leonard Bingham, 7, Kitson Road, Barnes, London,
S.W. 13.
(Finsbury Technical College, London.)
- 1919 Rhodes, Henry Taylor Fowkes, Creeksea, near Burnham-on-Crouch,
Essex.
(G. H. Perry, O.B.E., F.I.C.)
- 1920 Rice, Frederick, Collegiate House, Upper George Avenue, Huddersfield.
(Technical College, Huddersfield.)
- 1920 Richards, Thomas, 33, Norris Street, Darwen, Lancs.
(Municipal Technical School, Blackburn.)
- 1921 Richer, Asher Simon, 62, Greenwood Road, London, E. 8.
(East London College, London.)
- 1920 Rider, Harold Baty, 81, Atherley Road, Southampton.
(University College, London.)
- 1920 Ridgway, Leslie Randal, Glent Mount, Stalybridge.
(The University of Manchester.)
- 1916 Ridyard, Herbert Norman, 58, Holywell Hill, St. Albans, Herts.
(C. H. Cribb, B.Sc., F.I.C.)
- 1920 Ritchie, Peter Aitken, 4, Montagu Terrace, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1920 Rixon, Frederick, 35, Trinity Street, Huddersfield, Yorkshire.
(South-Western Polytechnic, London.)
- 1920 Robb, William, 11, Glenview, Paisley, Scotland.
(Royal Technical College, Glasgow.)
- 1921 Roberts, Denis, 120, Hillingdon Street, Kennington, London, S.E. 17.
(Northern Polytechnic Institute, London.)
- 1911 Roberts, John David, B.Sc. (Wales), Analytical Laboratory, 28, Museum
Street, London, W.C. 1.
(A. E. Parkes, F.I.C.)
- 1920 Robertson, Alexander, M.A. (Aberd.), Charlesfield, Turriff, Aberdeen-
shire.
(The University of Glasgow.)
- 1919 Robertson, Gilbert Bruce, 20, Lockhart Street, Stonehouse, Lanarkshire.
(Royal Technical College, Glasgow.)
- 1920 Robertson, Kenneth James Rennie, Mayfield, Liverpool Road, Irlam,
Manchester.
(College of Technology, Manchester.)
- 1920 Robins, William George, 156, St. Luke's Road, Edgbaston, Birmingham.
(The University of Birmingham.)
- 1920 Robinson, Arthur, 157, Church Street, Pendleton, Manchester.
(Royal Technical Institute, Salford.)
- 1915 Roger, Robert, 243, Strathmartine Road, Dundee.
(University College, Dundee.)
- 1920 Rogers, Harold Belton, 80, Crawford Avenue, Sefton Park, Liverpool.
(The University of Liverpool.)
- 1921 Rolt, William Joseph Woodgate, 5, Honley Road, Catford, London, S.E.6.
(University College, London.)

- 1920 Roper, Edwin Claxton, The Pines, Red Hill, near Birstall, Leics.
(University College, Nottingham.)
- 1919 Rossiter, George Friend, 21, Fore Street, Tiverton, Devon.
(Birkbeck College, London.)
- 1917 Rowe, James Walker, 14, Lawn Creseent, Kew Gardens, Surrey.
(J. G. Lord, M.A., F.I.C.)
- 1918 Roy, William, 155, Comelypark Street, Glasgow.
(F. W. Harris, F.I.C.)
- 1903 Rudolf, Marcus Edward Stanley, 37, Beaufort Road, Edgbaston,
Birmingham.
(A. Chaston Chapman, F.R.S., F.I.C.)
- 1920 Rushworth, James, 11, Smithy Carr Lane, Brighouse, Yorks.
(Technical College, Huddersfield.)
- 1920 Russell, Miss Doris Helen, 16, Clanricarde Gardens, London, W. 2.
(South-Western Polytechnic, London.)
- 1920 Russell, William Lyle, Belmont House, Strand Road, Carlisle.
(Heriot-Watt College, Edinburgh.)

S

- 1921 Sach, John Sydney, 46, Rosaline Road, Fulham, London, S.W. 6.
(F. M. Potter, M.B.E., B.Sc., F.I.C.)
- 1920 Samson, Abraham, 85, Melrose Avenue, Cricklewood, London, N.W. 2.
(South-Western Polytechnic, London.)
- 1918 Sawers, Thomas Jack, Woodend, Eastwood, Giffnock, Renfrewshire.
(Royal Technical College, Glasgow.)
- 1921 Sayce, Leonard Alfred, 5, Toward Terrace, Sunderland.
(Armstrong College, Newcastle-on-Tyne.)
- 1916 Scarf, Frank, 51, High Street, Harborne, Birmingham.
(The University of Birmingham.)
- 1920 Scott, Robert, 12, Balsusney Road, Kirkcaldy, Fife.
(Heriot-Watt College, Edinburgh.)
- 1921 Scott, Miss Winifred Isabel, Model Schools, Ballymena, Ireland.
(Royal College of Science for Ireland.)
- 1921 Seager, John Horsford, 1, St. Mary's Road, Faversham, Kent.
(King's College, London.)
- 1920 Seal, Ralph John, 14, Woodend, Sutton, Surrey.
(Finsbury Technical College, London.)
- 1921 Secker, Donald, 65, Tanfield Road, Birkby, Huddersfield.
(Technical College, Huddersfield.)
- 1914 Senior, Alan, M.C., B.Sc. (Leeds), Holmcroft, 118, Fagley Road, Bradford, Yorks.
(University of Leeds.)
- 1914 Sewell, John, 166, Victoria Street, London, S.W. 1.
(Leo Taylor, F.I.C.)
- 1921 Shacklock, Cecil Wilson, Stanhope Gardens, London, N. 4.
(Northern Polytechnic Institute, London.)

- 1920 Shaw, Brian Duncan, Fern's Hollow, Station Road, Ilkeston, Derbyshire.
(University College, Nottingham.)
- 1920 Shaw, George S. Albion Terrace, Hartlepool, Co. Durham.
(C. J. H. Stock, B.Sc., F.I.C.)
- 1920 Shaw, Richard Arthur Barnsley, 3, Earl's Court Square, London, S.W. 5.
(Imperial College of Science and Technology, London.)
- 1920 Shilling, William George, The Mill, Preston Village, Faversham, Kent.
(East London College, London.)
- 1919 Shimwell, John Lister, 70, Station Road, Harborne, Birmingham.
(The University of Birmingham.)
- 1913 Shore, Miss Agnes, The University, Leeds.
(King's College, London.)
- 1920 Shrewsbury, Richard Arnold, 2, Radnor Avenue, Harrow.
(Imperial College of Science and Technology, London.)
- 1919 Simpson, Miss Mary Constance, 2, Omelie Terrace, Joppa, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1919 Singer, Nathan, 147, Upper Clapton Road, London, E. 5.
(Finsbury Technical College, London.)
- 1921 Smetham, Denis John, 60, Lordship Park, Stoke Newington, London, N. 16.
(King's College, London.)
- 1921 Smirles, William Nelson, 25, Florence Road, Acocks Green, Birmingham.
(Municipal Technical School, Birmingham.)
- 1921 Smith, Daniel Angus, 22, Grundy Street, Hyson Green, Nottingham.
(University College, Nottingham.)
- 1919 Smith, Donald Alford, 138, Portway, West Ham, London, E. 15.
(Finsbury Technical College, London.)
- 1915 Smith, Douglas Gordon, D.S.M., Hucclecote Lodge, Hucclecote, near Gloucester.
(Imperial College of Science and Technology, London.)
- 1915 Smith, Francis William Hodges, 181, Belle Vue Road, Leeds.
(A. R. Smith, M.Sc., F.I.C.)
- 1920 Smith, Gavin Hamilton, Ardfein, Falkirk.
(Heriot-Watt College, Edinburgh.)
- 1920 Smith, George Henderson, M.C., Crindledyke Cottage, Newmains, Lanarkshire, Scotland.
(Royal Technical College, Glasgow.)
- 1919 Smith, George Stanley, 67, High Street, Barnstaple, N. Devon.
(East London College, London.)
- 1920 Smith, Harry, 2, Federation Road, Abbey Wood, London, S.E. 2.
(East London College, London.)
- 1920 Smith, James, 8, Church Street, Rastrick, Brighouse, W. Yorks.
(Technical College, Huddersfield.)
- 1920 Smith, James Clark, Abbotsford, 16, Empress Avenue, Wanstead Park, London, E. 12.
(F. M. Potter, M.B.E., B.Sc., F.I.C.)
- 1920 Smith, Stanley James, 37, Bedford Road, Harrow, Middlesex.
(Sir John Cass Technical Institute, London.)

- 1920 Smith, Walter, 69, Montpelier Park, Edinburgh.
(B. D. Porritt, M.Sc., F.I.C.)
- 1920 Smith, Wilfred, 76, Noel Street, Nottingham.
(University College, Nottingham.)
- 1917 Smith, William, M.A., c/o Mrs. McKenzie, Craigmare, Shore Street,
Ullapool, Ross-shire.
(Heriot-Watt College, Edinburgh.)
- 1920 Snell, Arnold Arthur Hony, 17, Dangan Road, Wanstead, London, E. 11.
(Sir John Cass Technical Institute, London.)
- 1920 Snodgrass, George Archibald, 11, Victoria Crescent, Dowanhill, Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Snow, Frederick Henry, 57, Cobham Road, Kingston-on-Thames.
(Finsbury Technical College, London.)
- 1914 Snow, Walter Alfred, Ashmore, 113, Old Road West, Gravesend.
(W. Lawrence Gadd, V.D., F.I.C.)
- 1920 Southall, Colin Lambert, B.Sc. (Birm.), 39, Gough Road, Edgbaston,
Birmingham.
(The University of Birmingham.)
- 1916 Southerton, Leslie Charles, 128, Golden Hillock Road, Small Heath,
Birmingham.
(The University of Birmingham.)
- 1920 Sowter, Frederick Archibald, 30, Nelson Street, London Road, Leicester.
(Ellis Clayton, F.I.C.)
- 1920 Speedy, Alan, 60, Avon Place, Springfield, Mass., U.S.A.
(Sir John Cass Technical Institute, London.)
- 1921 Spence, John Walker, 30, Priory Park Road, Kilburn, London, N.W. 6.
(South-Western Polytechnic, London.)
- 1921 Spendlove, Percy Frank, 50, Wimbledon Park Road, Wandsworth,
London, S.W. 18.
(Imperial College of Science and Technology, London.)
- 1920 Spicer, George William, c/o London Central Y.M.C.A., Tottenham Court
Road, London, W.C. 1.
(W. L. St. J. Alton, F.I.C.)
- 1920 St. Claire, Gerald, c/o The Magadi Soda Co., Ltd., Lake Magadi, British
East Africa.
(James Gray, F.I.C.)
- 1909 Stead, Frederick Arnold, Everdon, Redcar, Yorks.
(Armstrong College, Newcastle-on-Tyne.)
- 1920 Steel, James King, 2, South Park Drive, Paisley.
(Royal Technical College, Glasgow.)
- 1921 Steele, Andrew, 20, Drumoyne Avenue, Linthouse, Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Stephenson, Henry, Walton Mount, Walton, near Wakefield, Yorks.
(The University of Leeds.)
- 1919 Sterne, Edmund Joseph, Tara, Highfield Road, Rock Ferry, Cheshire.
(G. H. Perry, O.B.E., B.Sc., F.I.C.)
- 1921 Stewart, Daniel, 10, Pilnmuir Street, Dunfermline, Fife.
(Heriot-Watt College, Edinburgh.)

- 1920 Stitt, Donald Douglas, 85, Cromwell Road, Crosshill, Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Storey, Ralph Charles, 119, Moorside, Armley, Leeds.
(The University of Leeds.)
- 1921 Stoton, Percy Fred, 66, Charrington Street, London, N.W. 1.
(East London College, London.)
- 1920 Stoyle, Francis Wilbert, 37, Kansas Avenue, Belfast, Ireland.
(Queen's University, Belfast.)
- 1920 Stuart, Leslie Donald, 147, Breakspeare's Road, Brockley, London,
S.E. 4.
(Finsbury Technical College, London.)
- 1912 Suckling, Ernest Victor, 60, Elmstead Road, Seven Kings, Essex.
(J. C. Thresh, M.D., D.Sc., F.I.C.)
- 1921 Surfleet, Robert, The Limes, Beekingham, Doncaster.
(The University of Sheffield.)
- 1920 Swanney, John William, 7, Jessfield Terrace, Leith.
(Heriot-Watt College, Edinburgh.)
- 1920 Sword, James, Waterside, Luggiebank, Cumbernauld Station, Dum-
bartonshire.
(The University of Glasgow.)

T

- 1920 Tadman, Vernon Thorpe, 189, Woodborough Road, Nottingham.
(University College, Nottingham.)
- 1920 Tamplin, Morgan James, c/o Overseas Club, Aldwych, London, W.C. 2.
(Royal School of Mines, London.)
- 1920 Tankard, Joseph, 11, Constance Road, Deane, Bolton, Lanes.
(J. H. Lester, M.Sc., F.I.C.)
- 1918 Tayar, Robert Alfred Victor, 2, Laxey Road, Rotton Park, Birmingham.
(William Russell, F.I.C.)
- 1911 Taylor, Alexander Jefferson, B.Sc. (Maritzburg), School of Agriculture,
Cedara, Natal, S. Africa.
(J. S. Jamieson, F.I.C.)
- 1920 Taylor, George, Brook Cottage, Matlock Green, Derbyshire.
(University College, Nottingham.)
- 1920 Taylor, George Vincent, Westwood, 380, Wellington Road North, Heaton
Chapel, Stockport.
(W. D. Rogers, B.Sc., A.R.C.S., F.I.C.)
- 1919 Taylor, Harold, 16, Bristol Road, Leeds.
(Central Technical School, Leeds.)
- 1918 Taylor, James, 2, Nibthwaite Road, Harrow, Middlesex.
(East London College, London.)
- 1919 Taylor, Jack Francis Mahon, 10, Meynell Crescent, South Hackney,
London, E. 9.
(The University of Cambridge.)
- 1919 Taylor, James Gemmell, Calderbank, Baillieston, Glasgow.
(The University of Glasgow.)

- 1921 Taylor, Leslie Richard Gunn, School House, Bishop's Lawton, Barnstaple, Devon.
(Imperial College of Science and Technology, London.)
- 1921 Thatcher, Alfred Ronald, 94, Brecknock Road, London, N. 7.
(Finsbury Technical College, London.)
- 1919 Thom, George Victor.
(The University of Edinburgh.)
- 1920 Thom, William Albert Strang, The Hill, Dunlop, Ayrshire.
(Royal Technical College, Glasgow.)
- 1921 Thomas, Edward Boaden, 31, Ordnance Road, St. John's Wood, London, N.W. 8.
(F. H. Carr, C.B.E., F.I.C.)
- 1920 Thomas, Miss Elsie Margaret, 21, Liscard Road, Wavertree, Liverpool.
(John Hanley, F.I.C.)
- 1920 Thomas, Garfield, 20, College Street, Aberdare, S. Wales.
(The University, Manchester.)
- 1909 Thomas, Howel Ernest Lewis, 130, Queen's Gate, Kensington, London, S.W.
(King's College, London.)
- 1920 Thomas, Harold Hirst, 69, Blackman Lane, Leeds.
(The University of Leeds.)
- 1921 Thomas Iorwerth, 7, Carlton Road, Sunny Bank, Clydach-on-Tawe, Glam.
(H. J. Williams, F.I.C.)
- 1920 Thompson, George, Ballykennedy, Dundrod, Crumlin, Co. Antrim.
(Queen's University, Belfast.)
- 1921 Thompson, Stephen Percy, 7, Eckington Terrace, Glapton Road, Nottingham.
(University College, Nottingham.)
- 1919 Thompson, William Andrew, 5, Patrick Road, West Bridgford, Notts.
(University College, Nottingham.)
- 1920 Thomson, Archibald, 7, Lochlea Road, Newlands, Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Thomson, Douglas, Chapel of Craibstone, Bucksburn, Aberdeenshire.
(The University of Aberdeen.)
- 1912 Thomson, Matthew Sydney, B.A. (Cantab.), 55, Heron Court Road, Bournemouth.
(J. G. Lerd, M.A., F.I.C.)
- 1917 Thomson, Robert William Murray, 1, Hyndford Terrace, Dundee.
(University College, Dundee.)
- 1920 Thorn, Stanley Charles Hammond, 44, Castelnau, Barnes, London, S.W. 13.
(Finsbury Technical College, London.)
- 1920 Thornewell, Miss Clarice Elizabeth, 163, Rood End Road, Oldbury, near Birmingham.
(H. V. Potter, B.Sc., F.I.C.)
- 1909 Thornley, Tom, B.Sc., A.R.C.S. (Lond.), Sunnyhurst, Shackleton Road, Southall, Middlesex.
(Imperial College of Science and Technology, London.)

- 1919 Thornton, Arthur James Edward, 38, Battersea Park Road, London, S.W. 11.
(King's College, London.)
- 1920 Thorp, Edwin William, Thruxton, Tennyson Road, Bognor, Sussex.
(University College, London.)
- 1921 Tidy, Sydney George, 77, Malvern Road, Thornton Heath, Surrey.
(Finsbury Technical College, London.)
- 1921 Tillotson, Arthur, 28, Longroyd Street, Dewsbury Road, Leeds.
(Central Technical School, Leeds.)
- 1921 Todd, Gordon Watson, Elmside, Worcester Park, Surrey.
(Imperial College of Science and Technology, London.)
- 1920 Todd, William Millan, Ferndene, Blinkbonny Road, Falkirk.
(Royal Technical College, Glasgow.)
- 1917 Toms, Harold, B.Sc. (Lond.), Lindene, Blake Hall Road, Wanstead, London, E. 11.
(Birkbeck College, London.)
- 1918 Tookey, Miss Phyllis Margaret, Combe Lodge, Duncombe Hill, Forest Hill, London, S.E. 23.
(E. T. Brewis, F.I.C.)
- 1920 Torkington, Sidney, 9, Milton Place, Ashton-under-Lyne, Lancs.
(Royal Technical Institute, Salford.)
- 1920 Townsend, Harry, The College, Chester.
(Technical College, Huddersfield.)
- 1920 Trace, Leslie Herbert, Westwood, Forty Lane, Wembley, Middlesex.
(T. F. Harvey, F.I.C.)
- 1920 Trescot-Brinkworth, Denis John, 8, Marshfield Road, Chippenham, Wilts.
(Finsbury Technical College, London.)
- 1921 Tritton, Frederic Jenner, 11, Vicarage Mansions, West Green, London, N. 15.
(King's College, London.)
- 1918 Trotman, Edward Russell, 3, Wellington Circus, Nottingham.
(S. R. Trotman, M.A., F.I.C.)
- 1921 Tunstall, Richard Brian, 16, College Road, Saltley, Birmingham.
(The University of Birmingham.)
- 1920 Turley, Harold George, 3, Lavenham Road, Southfields, London, S.W. 18.
(Battersea Polytechnic, London.)
- 1921 Turner, Frank, 8, Charlesworth Street, Islington, London, N. 7.
(Sir John Cass Technical Institute, London.)
- 1919 Turner, Percival Elisha, Bath Cottage, Bath Road, Beenham, near Reading.
(University College, Reading.)
- 1917 Turner, William Oliver, 78, Richmond Road, Leytonstone, London, E. 11.
(East London College, London.)

U

- 1921 Umanski, Arthur Joseph Victor, 71, Staverton Road, Brondesbury Park, London, N.W. 2.
(Sir John Cass Technical Institute, London.)

- 1921 Urquhart, Alexander Robert, 106, Marchmont Road, Edinburgh.
(The University of Edinburgh.)

V

- 1921 Vigar, Laurence Edward Philip, 35, Botha Road, Plaistow, London,
E. 13.
(T. T. Cocking, F.I.C.)
- 1919 Vince, Alfred Sydney, Assayers Department, Royal Mint, Ottawa,
Canada.
(Sir John Cass Technical Institute, London.)

W

- 1921 Walker, Ernest, B.Sc. (Liv.), 5, Willoughby Road, Waterloo, near
Liverpool.
(South-Western Polytechnic, London.)
- 1921 Walker, John, Clifton House, Slaithwaite, near Huddersfield.
(Technical College, Huddersfield.)
- 1921 Walker, Thomas, 151, Stockwell Park Road, London, S.W. 9.
(South-Western Polytechnic, London.)
- 1920 Walker, Thomas Henry, Porterswell, Uddingston, near Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Walker, William Basil, 61, Mundella Road, Meadows, Nottingham.
(University College, Nottingham.)
- 1920 Wall, Thomas John, Oakworth Villa, St. Andrew's Road, Malvern.
(The University of Oxford.)
- 1920 Wall, William, 111, Berridge Road, Sherwood Rise, Nottingham.
(University College, Nottingham.)
- 1919 Wallis, Kenneth, Thorpe Close, Long Eaton, Notts.
(University College, Nottingham.)
- 1920 Warburton, Eric, 57, Hornsey Rise Gardens, Crouch End, London, N. 19.
(Birkbeck College, London.)
- 1920 Ward, Allan Miles, Bridge Street, Walton-on-Thames, Surrey.
(Birkbeck College, London.)
- 1920 Ward, Charles Frederick, 17, High Street, Old Basford, Nottingham.
(University College, Nottingham.)
- 1920 Ward, Harold George, Tresco, Cornwall Road, Sutton, Surrey.
(Finsbury Technical College, London.)
- 1921 Ward, Henry Herbert, 4, Lyncot Road, Aintree, Liverpool.
(The University of Liverpool.)
- 1920 Watson, David, 118, Onslow Drive, Denistoun, Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Watson, David Lindsay, 81, Montgomery Street, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1921 Watson, Harry Freeman, 5, Wrightson Street, Norton-on-Tees, Co.
Durham.
(Armstrong College, Newcastle-on-Tyne.)

- 1921 Watson, Stephen John, 35, Oakfield Terrace, Gosforth, Newcastle-on-Tyne.
(Armstrong College, Newcastle-on-Tyne.)
- 1921 Watson, William John, 539, Holloway Road, London, N. 19.
(Northern Polytechnic Institute, London.)
- 1920 Waygood, William Arthur, 134, Braidwood Road, Catford, London, S.E. 6.
(Imperial College of Science and Technology, London.)
- 1921 Wayne, Edward Johnson, 20, Cowper Street, Leeds.
(The University of Leeds.)
- 1919 Webb, Kenneth Frederick, 136, McDonald Road, Durban, S. Africa.
(H. G. Weall, F.I.C.)
- 1920 Webster, Alec, 134, Woodsley Road, Leeds.
(The University of Leeds.)
- 1921 Webster, David Mackay, 17, Watson Street, Falkirk, Scotland.
(The University of Edinburgh.)
- 1920 Webster, James D., 39, Partickhill Road, Glasgow.
(Royal Technical College, Glasgow.)
- 1919 Weeks, Edward Joseph, 62, Forest Hill Road, East Dulwich, London, S.E. 22.
(East London College, London.)
- 1921 Weingott, Hyam, B.Sc., A.R.C.S. (Lond.), 30, Rock Lane West, Rock Ferry, Cheshire.
(P. G. Jackson, F.I.C.)
- 1917 Welch, Frank Robert, 11, New Buildings, Tower Road, Four Oaks, Sutton Coldfield, Warwickshire.
(S. S. Napper, A.C.G.I., F.I.C.)
- 1920 West, Walter, 32, Oakfield Grove, Bradford.
(J. A. Newton Friend, D.Sc., Ph.D., F.I.C.)
- 1920 Westlake, Eric Paul, c/o Messrs. L. B. Holliday & Co., Ltd., Deighton, Huddersfield.
(Arthur Clayton, D.Sc., A.R.C.S., F.I.C.)
- 1917 Weston, Arnold, Gatesgarth, Poulton Road, Carleton, Poulton-le-Fylde.
(King's College, London.)
- 1921 Weston, Frank Ramsay, 29, Sibella Road, Clapham, London, S.W. 4.
(Imperial College of Science and Technology, London.)
- 1919 Weston, Stanley Haworth, 25, Linn Terrace, Cathcart, Glasgow.
(Royal Technical College, Glasgow.)
- 1920 Westrip, George Meredyth, Palmyra, Portsmouth Road, Surbiton, Surrey.
(University College, London.)
- 1920 Whipp, James Ewart, 15, St. John Street, Longsight, Manchester.
(The University of Manchester.)
- 1918 Whitby, William Henry, 127, Mersey Road, Widnes, Lanes.
(W. D. Rogers, B.Sc., A.R.C.S., F.I.C.)
- 1920 White, Charles Bertram, 7, Bellevue Gardens, Kemp Town, Brighton.
(Imperial College of Science and Technology, London.)
- 1921 White, Colin McLuckie, 16, Hopetoun Place, Winchburgh, West Lothian, Scotland.
(Heriot-Watt College, Edinburgh.)

- 1920 Whitfield, Leonard Fairfax, Mountside Cottage, Sudbury Hill, Harrow-on-the-Hill, Middlesex.
(F. Mollwo Perkin, C.B.E., Ph.D., F.I.C.)
- 1920 Whiting, William Henry, 13, Manvers Street, Bath.
(University College, Cardiff.)
- 1915 Whitworth, Abraham Bruce, 244, Garngad Hill, Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Wightman, George Manderston, 10, Steels Place, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1919 Wightman, Wilfred Alan, 1, Firsby Road, Stamford Hill, London, N. 16.
(The University of Oxford.)
- 1919 Wilkes, Horace Edward, 60, Trinity Road, West Bromwich.
(Municipal Technical School, Birmingham.)
- 1920 Wilkie, Alexander Stewart, Beach Villa, Bay Road, Wormit, Fife.
(Heriot-Watt College, Edinburgh.)
- 1919 Wilkie, John, Muiredge Terrace, Baillieston, Glasgow.
(Royal Technical College, Glasgow.)
- 1921 Wilkins, Caryll Ernest Vivian, B.A. (Cantab.), The Laurels, Old Evington, near Leicester.
(The University of Cambridge.)
- 1920 Wilkinson, Sidney Davis, 31, Albany Road, Manor Park, London, E. 12.
(A. E. Parkes, F.I.C.)
- 1919 Willcox, Cyril Mason, 4, Worple Avenue, Wimbledon, London, S.W. 19.
(The University of Cambridge.)
- 1919 Williams, Albert Lester, 103, Thornbury Avenue, Bradford, Yorks.
(B. A. Burrell, F.I.C.)
- 1919 Williams, George Leslie Brandon, 25, Warkworth Street, Cambridge.
(Birkbeck College, London.)
- 1921 Williams, Kenneth Alan, 16, Messaline Avenue, Acton, London, W. 3.
(E. R. Bolton, F.I.C.)
- 1920 Williams, Kenneth Edward Nethercoate, 64, Kingsgate Street, Winchester.
(School of the Pharmaceutical Society.)
- 1921 Williams, Leslie Henry, 19, Cranwich Road, Stamford Hill, London, N. 16.
(Northern Polytechnic Institute, London.)
- 1919 William, Ralph, 15, St. Vincent Road, Newport, Mon.
(J. A. Hatfield, F.I.C.)
- 1920 Willman, Joseph Englebert, 13, Mina Road, Merton Park, London, S.W. 19.
(South-Western Polytechnic, London.)
- 1920 Wilshire, Laurence Arthur, 69, Maury Road, Stoke Newington, London, N. 16.
(Finsbury Technical College, London.)
- 1920 Wilson, George Edward, 16, Caledonian Road, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1921 Wilson, Gerald William France, Morden, Duddingston Road, Portobello, Scotland.
(The University of Edinburgh.)

- 1920 Wilson, Harold Frederic, 16b, Kennington Oval, London, S.E. 11.
(Battersea Polytechnic, London.)
- 1920 Wilson, John Norman, 30, Spottiswoode Street, Edinburgh.
(Heriot-Watt College, Edinburgh.)
- 1910 Wilton, John Boswell, 87, Abbey Road, Barrow-in-Furness.
(H. B. Weeks, F.I.C.)
- 1916 Winbolt, Eric Arthur, 45, Auckland Road, Roman Road, Bow, London,
E. 3.
(King's College, London.)
- 1921 Winsor, William George, Burton House, Mill Hill, London, N.W. 7.
(Northern Polytechnic Institute, London.)
- 1921 Wishart, Carl Courtenay, 3, Mayfield Terrace, Edinburgh.
(The University of Edinburgh.)
- 1920 Wood, Alexander, 53, Rosenau Road, Battersea Park, London, S.W. 11.
(South-Western Polytechnic, London.)
- 1920 Woodhead, George Kenworthy, Heymoor Villas, Shepley, near Hudders-
field.
(L. G. Paul, Ph.D., F.I.C.)
- 1905 Woodhead, John Ezra, 61, Chancery Lane, London, W.C. 2.
(The late Thomas Fairley, F.I.C.)
- 1921 Woodley, James William Allan, 22, Taunton Road, Lee, London, S.E. 12.
(King's College, London.)
- 1921 Woodroffe, Frank Windham, 43, Mexborough Street, Chapeltown Road,
Leeds.
(F. G. Conyers, F.I.C.)
- 1921 Wooldridge, Lennox Charles, 42, Moyland Road, Fulham, London, W. 6.
(University College, London.)
- 1920 Woolley, Dennis Vernon, Farmwood, Christchurch, Newport, Mon.
(G. Rudd Thompson, F.I.C.)
- 1919 Woolley, Raymond, 5, Darwin Terrace, Derby.
(Joseph Yates, M.Sc., F.I.C.)
- 1920 Woosley, Duncan Pax, 96, Roxburgh Road, Harrow, Middlesex.
(C. A. Hill, B.Sc., F.I.C.)
- 1921 Wright, Eustace Cecil Barton, Oakleigh, Godstone, Surrey.
(Birkbeck College, London.)
- 1918 Wright, Miss Eva Muriel, B.Sc. (Lond.), 141, Mitcham Lane, Streatham,
London, S.W. 16.
(King's College, London.)
- 1921 Wright, Miss Winifred Mary, 3, Addison Road, Kensington, London, W.
(The University of Cambridge.)
- 1920 Wylie, Andrew Robertson, Langlands, Bridge of Allan, Stirlingshire.
(Heriot-Watt College, Edinburgh.)
- 1920 Wyman, Miss May Elizabeth, 63, Stroud Green Road, Finsbury Park,
London, N. 4.
(Finsbury Technical College, London.)

Y

- 1920 Yapp, Miss Dorothy, Beech Mount, Haywards Heath, Sussex.
(School of the Pharmaceutical Society.)

- 1920 Yarker, George Herbert, Fulbeck, Grantham, Lines.
(University College, Nottingham.)
- 1920 Yates, Eric John Cabena, The School House, Silverdale, N. Staffs.
(The University of Birmingham.)
- 1920 Yeates, Reginald Leslie, 7, Stopford Road, Upton Manor, London, E. 13.
(Sir John Cass Technical Institute, London.)
- 1919 Yorston, James, 29, Winton Place, Tranent, East Lothian, Scotland.
(Heriot-Watt College, Edinburgh.)
- 1919 Young, Edward Bernard, East London College, London, E. 1.
(East London College, London.)
- 1920 Young, James Pollock, 9, Anchor Place, Bellshill, Lanarkshire.
(The University of Glasgow.)
- 1920 Young, William, 12, Keith Road, Hayes, Middlesex.
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